BC
Ministry of
Energy, Mines and
Petroleum Resources
Hon. Anthony J. Brummet, Minister

MINERAL RESOURCES DIVISION

1984
SUMMARY OF OPERATIONS

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VICTORIA
BRITISH COLUMBIA
CANADA

MARCH 1986

FOREWORD

The *Summary of Operations, 1984, Mineral Resources Division* provides a review of the mineral industry, detailed statistics of its performance, and a summary of the activities of the Mineral Resources Division. These three elements--review, statistics, and operations of the Division--form three chapters that follow the format of the equivalent chapters in the *Annual Report of the Minister* in 1979. The creation of a volume, *Summary of Operations,* parallels the practice in the Petroleum Resources Division and it is intended to eventually get the data of the industry to the interested public in a more timely manner while leaving the *Annual Report of the Minister* free of details and statistics.

The evolution of Ministry yearly reports continues as the mineral and fuel resources industry grows and diversifies. *Annual Reports of the Minister of Mines* have been published since 1874. Changes in name of the Ministry occurred in 1959, to Mines and Petroleum Resources, and in 1978, to Energy, Mines and Petroleum Resources. In addition, beginning in 1969 geological and technical reports previously published as part of the Annual Report were published as a separate volume entitled *Geology, Exploration and Mining in British Columbia*. Starting in 1975, this technical volume was divided into separate reports and were to be issued as prepared. Detailed information on mine safety, fatal accidents, dangerous occurrences, etc., was included in the Annual Report until 1973, for 1974 this information was issued separately and subsequently forms part of the separate volume *Mining in British Columbia*.

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CHAPTER 1

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SUMMARY OF OPERATIONS

REVIEW

The performance of the minerals market was mixed during 1984. Overall, demand for British Columbia mineral products showed an improvement during the year due to the higher levels of economic activity, particularly in the United States.

The total value of mineral production (including solid minerals, petroleum, and natural gas) was $3 357.0 million in 1984, up $497.9 million or 17.4 per cent from $2 859.1 million in 1983. In terms of constant dollars the real value of mineral production increased by 12.2 per cent over 1983.

Solid mineral production in the province totalled $2 359.2 million during 1984, representing an increase of over one-fifth from $1 957.7 million in 1983.

The increase was primarily due to the increase in coal production in the Northeast Coalfields. Industrial minerals also contributed to the increase, while most base metals, except molybdenum and zinc, declined in the value of production during 1984.

The prices for such major minerals as copper, coal, asbestos, and precious metals decreased. The demand for base metals picked up in the first half of 1984, but the improvement was not sustained throughout the year as the rate of economic recovery slackened, putting a downward pressure on metal prices.

The share of solid minerals increased from 68.5 per cent in 1983 to 70.3 per cent in 1984.

The total value of 1984 and percentage change since 1983 for the various sectors are estimated as follows:

	1984 VALUE $	PERCENTAGE CHANGE
Metals........................	1 036 900 793	-6.2
Industrial Minerals...........	114 669 521	+28.1
Structural Materials..........	200 097 295	-4.0
Coal..........................	1 007 519 670	+81.3
Petroleum and Natural Gas....	997 750 056	+10.9
Total Value...................	3 356 937 335	+17.4

Most British Columbia producers of metals operated at or below break-even levels as a result of weak metal prices due to over capacity, high interest rates, the strong United States dollar, and continued exports by producers in less developed countries.

During 1984, coal regained its position as the most valuable solid mineral produced in the province. Both production and the total value increased substantially, reflecting new production from the northeast and a major increase in production from Westar's Greenhills mine in the southeast.

Copper fell to third place ($517.8 million) after coal ($1 007.5 million) and natural gas ($518.7 million) in value of production in 1984. Other major minerals in order of value of production during 1984 were: crude oil, $434.6 million; silver, $121.4 million; gold, $118.1 million; zinc, $115.2 million; molybdenum, $113.8 million; asbestos, $75.3 million; and cement, $69.9 million.

Unit prices for most major minerals remained weak during 1984, with the exception of higher prices for lead, molybdenum, sulphur, and sand and gravel.

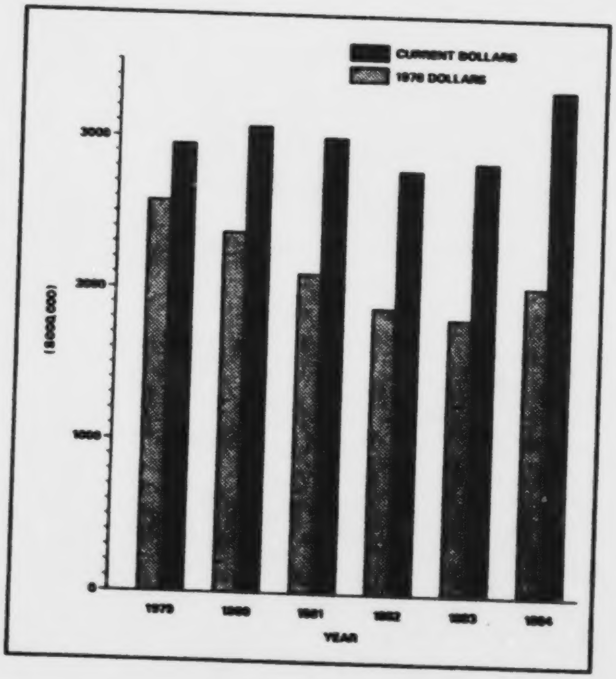

Figure 1-1. British Columbia Mineral Production, 1979-1984 (including solid minerals and natural gas and petroleum).

Details of mineral production during 1984 compared to 1983 are shown in Table 1-1. Figure 1-1 illustrates total mineral production in both current and constant dollars during 1979-1984. Major minerals and their proportional contributions to the total mineral production in British Columbia are illustrated on Figure 1-2.

TABLE 1-1. MINERAL PRODUCTION IN BRITISH COLUMBIA, 1983 AND 1984

		1983		1984	
	UNITS	QUANTITY	VALUE $	QUANTITY	VALUE $
METALS					
Copper	kg	282 864 697	561 111 733	280 070 497	517 765 234
Gold	g	7 981 354	130 872 318	7 244 440	118 137 206
Iron concentrates	t	496 823	13 078 465	198 464	6 584 179
Lead	kg	112 941 984	48 778 436	85 147 484	37 899 396
Molybdenum	kg	10 178 825	87 584 823	12 164 806	113 803 442
Silver	g	402 325 338	180 372 129	363 378 002	121 364 145
Zinc	kg	95 286 818	79 634 214	95 334 645	115 225 652
Others			4 583 744		6 121 539
Total Metals			1 106 015 862		1 036 900 793
INDUSTRIAL MINERALS					
Asbestos	t	81 653	53 395 853	92 123	75 295 765
Sulphur	t	488 733	24 862 954	508 917	27 215 071
Others			11 237 627		12 158 685
Total Industrial Minerals			89 496 434		114 669 521
STRUCTURAL MATERIALS					
Cement	t	853 064	71 080 982	939 354	69 939 148
Sand and Gravel	t	39 560 744	99 919 233	34 628 047	85 156 975
Others			37 401 313		45 001 172
Total Structural Materials			208 401 528		200 097 295
COAL	t	11 480 298	555 789 196	20 739 725	1 007 519 670
PETROLEUM AND NATURAL GAS					
Crude oil	m^3	2 078 771	402 075 887	2 094 156	434 600 112
Natural gas to pipeline	$10^3 m^3$	6 899 911	455 187 128	7 769 368	518 683 014
Others			42 088 264		44 466 930
Total Petroleum and Natural Gas			899 351 279		997 750 056
GRAND TOTAL			2 859 054 299		3 356 937 335

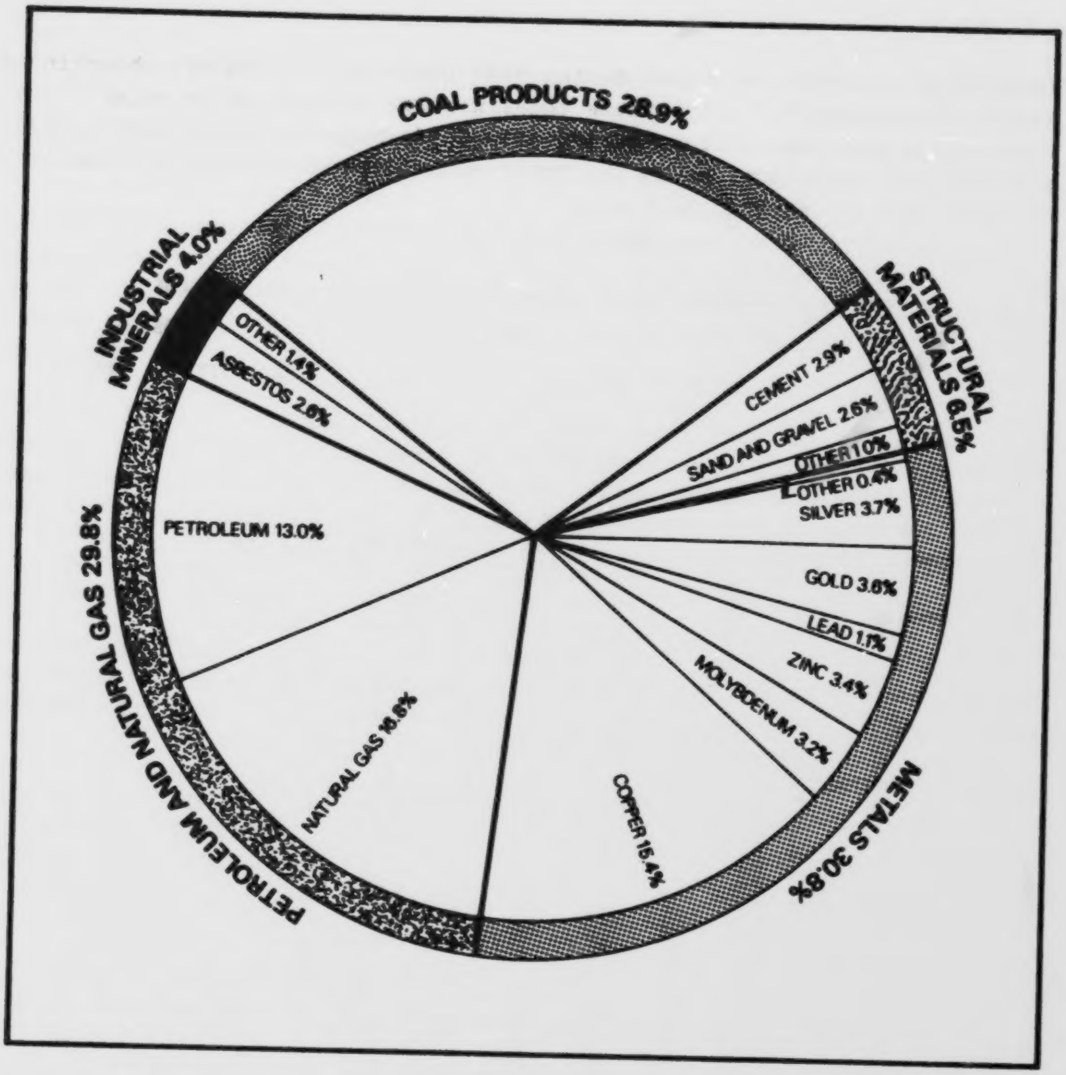

Figure 1-2. Major Mineral Commodities Produced in 1984 by Value.

OUTLOOK

The economic recovery that started in 1983 continued at a strong pace in the first half of 1984. After mid-year, however, market demand for minerals weakened. The rate of economic growth in 1985 is expected to be slow and metal consumers will continue to keep inventories low for fear of high interest rates and lower prices in terms of United States currency.

The outlook for 1985 is one of no major changes from 1984. Demand for zinc and industrial minerals is expected to continue at high levels.

Copper prices may recover somewhat. Precious metals are not likely to increase drastically. Coal production will continue to be high but prices are expected to remain weak.

The recent recession has closed a number of mines in British Columbia. It has also led to many cost-saving and limited production measures on the part of the current producers who have now positioned themselves to competitively face the challenges of cost containment and competition from less developed countries.

Emerging markets in the Pacific Rim countries hold great promise for British Columbia mineral producers who are stepping up marketing efforts in these areas.

The precious metals will continue to be the main areas of interest in mineral exploration in 1985. Other higher grade polymetallic deposits will also draw some special attention in the mineral exploration sector.

CHAPTER 2

ACTIVITIES OF THE MINERAL RESOURCES DIVISION

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INTRODUCTION

The Mineral Resources Division has had a long history of development, with its mission evolving from being simply administration of titles under the Provincial Secretary in 1859 to today's role of administering mineral placer and coal tenure systems, providing inspection and engineering services, carrying out geoscientific surveys and studies, administering guidelines to new mine development, and providing mineral economic and policy analyses and statistical data. The objectives of the Mineral Resources Division are:

to promote orderly development of the mineral resources of British Columbia;

to facilitate the process of discovery and renewal of the province's mineral resources;

to administer title to the mineral resources of the province in an efficient and effective manner;

to ensure the extraction of the province's mineral resources in a manner consistent with worker and public safety, with resource conservation, and with minimum environmental degradation;

to provide economic and statistical information, and analytical support and policy recommendations on the mineral sector, and on emerging issues on provincial mineral sector development opportunities and problems; and

to administer and coordinate the province's metal and coal mine review procedures.

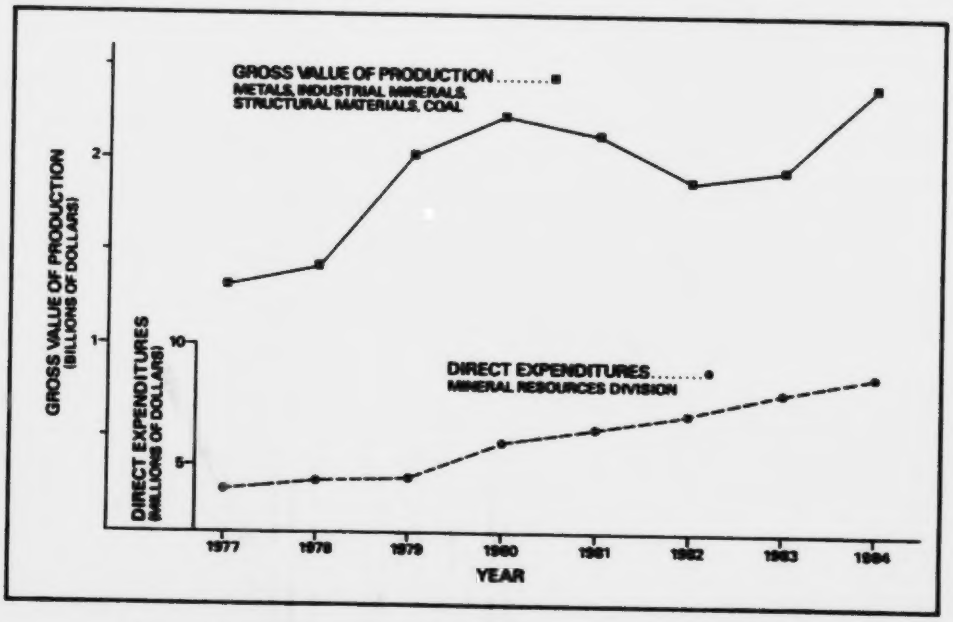
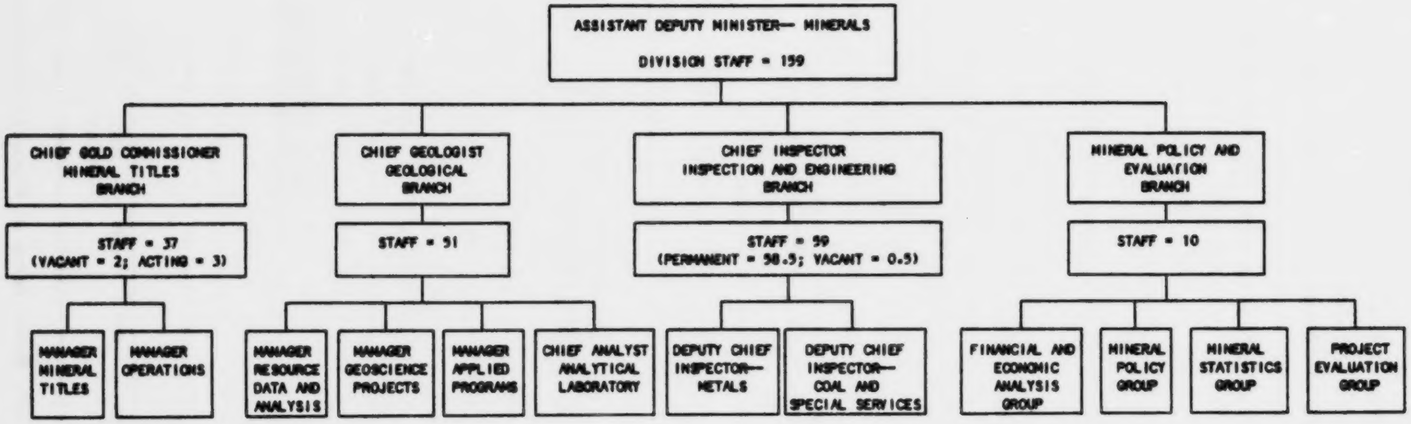


Figure 2-1. Gross Value of Production and Expenditures.

TABLE 2-1. ORGANIZATION CHART

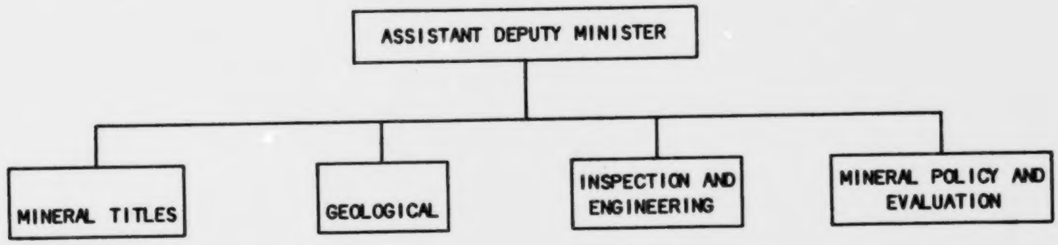
MINERAL RESOURCES DIVISION


ASSISTANT DEPUTY MINISTER— MINERALS
DIVISION STAFF = 159
CHIEF GOLD COMMISSIONER MINERAL TITLES BRANCH
STAFF = 37 (VACANT = 2; ACTING = 3)
MANAGER MINERAL TITLES
MANAGER OPERATIONS
CHIEF GEOLOGIST GEOLOGICAL BRANCH
STAFF = 51
MANAGER RESOURCE DATA AND ANALYSIS
MANAGER GEOSCIENCE PROJECTS
MANAGER APPLIED PROGRAMS
CHIEF ANALYST ANALYTICAL LABORATORY
CHIEF INSPECTOR INSPECTION AND ENGINEERING BRANCH
STAFF = 59 (PERMANENT = 58.5; VACANT = 0.5)
DEPUTY CHIEF INSPECTOR— METALS
DEPUTY CHIEF INSPECTOR— COAL AND SPECIAL SERVICES
MINERAL POLICY AND EVALUATION BRANCH
STAFF = 10
FINANCIAL AND ECONOMIC ANALYSIS GROUP
MINERAL POLICY GROUP
MINERAL STATISTICS GROUP
PROJECT EVALUATION GROUP

To carry out these objectives, the division is organized into four branches as shown on the organization chart (Table 2-1); their functions are summarized in Table 2-2. The budget to carry out the operations of the division is shown on Figure 2-1 in relationship to the gross value of production of minerals and coal in the province.

TABLE 2-2. FUNCTIONS OF THE MINERAL RESOURCES DIVISION

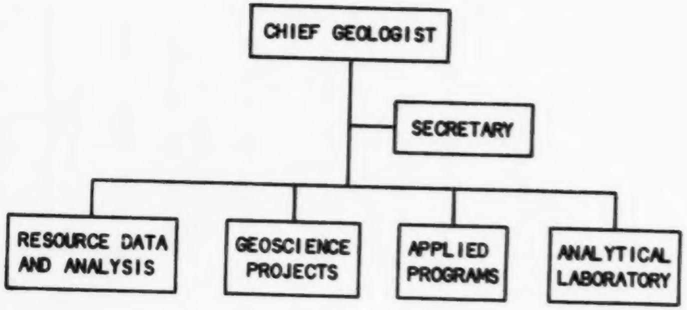
MINERAL RESOURCES DIVISION
ORGANIZATION AND FUNCTIONS


ASSISTANT DEPUTY MINISTER
MINERAL TITLES
GEOLOGICAL
INSPECTION AND ENGINEERING
MINERAL POLICY AND EVALUATION

MINERAL TITLES	GEOLOGICAL	INSPECTION AND ENGINEERING	MINERAL POLICY AND EVALUATION
MANAGEMENT OF MINERAL, COAL, AND PLACER TITLE	COAL AND MINERALS RESOURCE INVENTORY	SAFETY ENGINEERING	MINING PROJECT REVIEW GUIDELINES
TITLES POLICY AND LEGISLATION DEVELOPMENT	GEOSCIENTIFIC SURVEYS AND MAPPING	MINER HEALTH AND SAFETY	ECONOMIC/FINANCIAL ANALYSIS
CLAIM MAP SERVICE	FIELD AID AND LIAISON	PUBLIC MINING HAZARD ABATEMENT	MINERAL POLICY DEVELOPMENT
CLAIMS INSPECTION	EXPLORATION MONITORING	MINE RESCUE TRAINING	MINE PRODUCTION STATISTICS
	MINERAL DATA-BASE MAP AND REPORT SERVICE	MINE RECLAMATION AND MINE ENVIRONMENT	INTERGOVERNMENTAL LIAISON
	LAND USE STUDIES	RESOURCE CONSERVATION	
	ANALYTICAL LABORATORY	MINERAL AND COAL DEVELOPMENT GUIDELINES	
	PROSPECTORS' ASSISTANCE	MINING ROADS	

TABLE 2-4
ORGANIZATION, MANPOWER, AND BUDGET
GEOLOGICAL BRANCH

December 31, 1984


CHIEF GEOLOGIST
SECRETARY
RESOURCE DATA AND ANALYSIS
GEOSCIENCE PROJECTS
APPLIED PROGRAMS
ANALYTICAL LABORATORY

		RESOURCE DATA AND ANALYSIS	GEOSCIENCE PROJECTS	APPLIED PROGRAMS	ANALYTICAL LABORATORY	GENERAL MANAGEMENT	BRANCH TOTAL
STAFF		13	15	13	8	2	51
BUDGET: IN $1000s	84/85	$699.1	$1 013.9	$663.6	$435.2	$121.0	$2 932.8

SUPPLEMENTARY PROGRAMS

		REGIONAL GEOCHEMICAL SURVEYS RELATED RESEARCH	
	84/85	$100	$100.0
		GRAND TOTAL 84/85	$3 032.8

GEOLOGICAL BRANCH

INTRODUCTION

The Geological Branch is one of four branches in the Mineral Resources Division. Its role is to provide accurate and current information on the geology and the mineral and coal resources of British Columbia for government and industry; to provide maps, databases, ideas, and interpretations useful in the search for new deposits; and to stimulate and facilitate the exploration, development, and use of these resources for the benefit of the province.

To carry out this the branch is organized into four sections: Geoscience Projects; Resource Data and Analysis; Applied Geology; and Analytical Laboratory. Three figures summarize the program responsibility matrix (Table 2-3), the organization (Table 2-4), and the objectives and tasks by section (Table 2-5). The interrelationship and cooperative nature of the work is shown in Table 2-6. Figure 2-2 shows the various projects that were active in 1984 together with the regional geochemical survey coverage.

TABLE 2-3
GEOLOGICAL BRANCH MANAGEMENT AND ORGANIZATION MATRIX

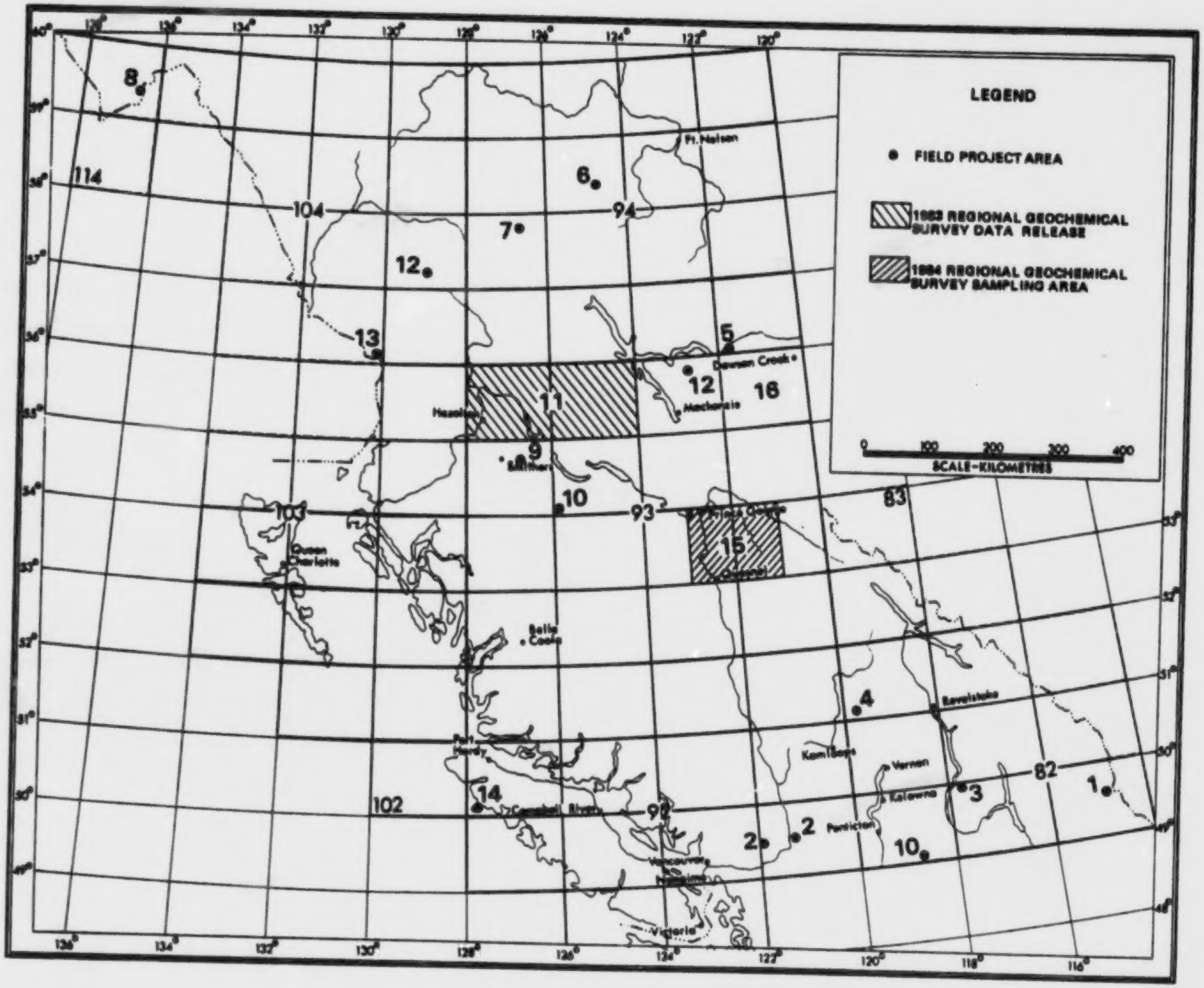
DISCIPLINES AND INTERESTS	ORGANIZATION AND PROGRAM RESPONSIBILITY			
	PROJECT	APPLIED	RESOURCE DATA	LAB.
RESOURCE TYPE				
Metallic	*	*	*	*
Nonmetallic	-	-	*	+
Coal	*	*	*	*
Geothermal	-			
RESEARCH AND DEVELOPMENT				
Geoscience research	*	+	-	-
Geological surveys	*	+	-	
Geochemical surveys and control	*	-	-	*
Analytical method development	-			*
FUNCTIONS				
Land use analysis and management	-	+	*	
Resource inventory analysis and management	-	+	*	
Industry intelligence	+	*	*	
Consultation service	*	*	*	+
Data processing	-		*	-
Core storage		*		
Prospector training	+	*	-	-
Geologist training	+	*	-	
Assayer certification				*

* = MAJOR ROLE; + = IMPORTANT ROLE; - = MINOR ROLE; (blank) = NO ROLE.

TABLE 2-5

GEOLOGICAL BRANCH

	RESOURCE DATA AND ANALYSIS	GEOSCIENCE PROJECTS	APPLIED GEOLOGY	ANALYTICAL LABORATORY
OBJECTIVES	* DATA BASE CONSTRUCTION * LAND USE MANAGEMENT * RESOURCE DEVELOPMENT	* DEVELOP EXPLORATION DATA AND CONCEPTS * METALLOGENY AND DEPOSIT MODELLING * REGIONAL AND COMMODITY EXPERTISE	* MONITOR EXPLORATION ACTIVITY * FIELD AID TO INDUSTRY * PROSPECTOR TRAINING * LAND USE MANAGEMENT	* CHEMICAL BACK-UP * QUALITY CONTROL * ANALYTICAL RESEARCH * AID TO INDUSTRY
TASKS	INVENTORIES REPORT APPROVALS NON-METALLIC STUDIES LAND USE EVALUATIONS RESOURCE ANALYSIS	GEOLOGICAL MAPPING AND RESEARCH GEOSCIENCE REPORTS REGIONAL GEOCHEMICAL AND GEOPHYSICAL SURVEYS	EXPLORATION MONITORING AND FIELD AID BY DISTRICT GEOLOGISTS MINERAL EXPLORATION INCENTIVE PROGRAM PROSPECTOR GRANTS AND COURSES SITE-SPECIFIC LAND USE STUDIES	ASSAYS AND CHEMICAL ANALYSES ANALYTICAL RESEARCH AND METHOD DEVELOPMENT CONTROL FOR GEOCHEM PROGRAM MINERAL SEPARATIONS


LEGEND
● FIELD PROJECT AREA
1983 REGIONAL GEOCHEMICAL SURVEY DATA RELEASE
1984 REGIONAL GEOCHEMICAL SURVEY SAMPLING AREA
0
100
200
300
400
SCALE-KILOMETRES
Ft. Nelson
Dawson Creek
Mackenzie
Hazelton
Smithers
Prince George
Quesnel
Queen Charlotte
Bella Coola
Port Hardy
Campbell River
Vancouver
Nanaimo
Victoria
Kamloops
Vernon
Kelowna
Penticton
Revelstoke
114
104
94
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102
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82
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16

Figure 2-2. Geological Branch, Regional Geochemical Surveys and Project Sites.

TABLE 2-6. SUMMARY OF MAJOR PROJECTS IN 1984

MAP NO.	PROJECT	AREA (NTS)	GEOLOGIST	STAGE	MOST RECENT PUBLICATION
1	Northern Dominion Coal Block	82G/10	W. Kilby, D. Grieve	FC	GF 84
2	Harrison Lake Gold	92G, H	G. Ray	FC	GF 84
	Coquihalla Gold Belt	92H	G. Ray	FC	GF 84
3	Tillicum Gold	82F, K	G. Ray, Y.T.J. Kwong	FC	GF 84
4	Hilton Rea Gold	82M	G.E.P. White	FC	GF 84
5	Butler Ridge Area	93	A. Legun	FC	GF 84
6	Wokkpash Park Proposal	94K	A. Legun	FC	GF 84
7	Toodoggone Precious Metal Deposits	94	A Panteleyev, T. Schroeter, (L. Diakow)	FC	GF 84
	Precious Metal Deposits in the Cordillera	—	A. Panteleyev, T. Schroeter, (L. Diakow)	I	—
8	Tatshenshini Area Massive Sulphides	—	D. MacIntyre, T. Schroeter	I	GF 84
9	Dome Mountain Gold	93L	D. MacIntyre	I	GF 84
10	Buck Creek Area	93L	B.N. Church	FC	GF 84
	Greenwood/Midway	82E	B.N. Church	FC	GF 84
11	Seeley Lake Coal	93M	G. White, J. Koo	FC	GF 84
12	Mt. Klappan Anthracite	104H	J. Koo	I	GF 84
	Carbon Creek Area	93O	A. Legun	FC	GF 84
13	Stewart Area Mineral Deposits	104B	D. Alldrick	FC	GF 84
14	Brooks Peninsula Vancouver Is.	92L	R.W. Smyth	FC	GF 84
15	Quesnel Gold-Copper	—	A. Panteleyev	I	—
16	Northeast Coalfield Correlation	93, 94	W. Kilby, (H. Oppelt)	I	GF 84
17	Metallogeny of S.E. B.C.	82	T. Höy, (F. Gautier)	I	GF 84
18	Regional Geochemical Sampling Program	93G/E, 93H/W	R. Schmitt, W.J. McMillan	FC	BCRGS 10,11 (GSC Open File 1000, 1001)
19	Precious Metal Deposits in British Columbia	—	A. Panteleyev, T. Schroeter	I	—
20	Carbonatites in British Columbia	82L, 83D, 93I, 93N	J. Pell, D. Hora	I	GF 84

NOTE: I = In Progress; FC = Fieldwork Complete; C = Completed;
GF 84 = Geological Fieldwork, 1984, Paper 1985-1
Names in brackets are graduate students.

1984/85 was a year of transition in the branch. Dr. Atholl Sutherland Brown retired as Chief Geologist after 33 years of distinguished service. Dr. W. R. Smyth was appointed his replacement in September 1984. The branch offices on Michigan Street were 'temporarily' relocated to 756 Fort Street. Government restraint policies initiated in 1983/84 continued into 1985 and presented an increased challenge for the branch to operate a meaningful field program. Staff was further reduced from 53 to 50, a 20-per-cent reduction in two years. However, on an optimistic note it appears likely that the province will join with the Federal Government in signing a five-year Mineral Development Agreement under E.R.D.A. to further the development of the province's exploration and mining industry. The pending agreement will greatly accelerate the branch's geological and geochemical surveys and the development of geoscience data systems.

The branch held its fourth annual Open House in Vancouver in January 1985 in conjunction with the Cordilleran Round-Up of the British Columbia and Yukon Chamber of Mines. Over 800 geoscientists and explorationists attended a lively day of talks and poster sessions.

GEOSCIENCE PROJECTS SECTION

Geoscientific mapping, surveys, and related research are provided by the Geoscience Projects Section in order to stimulate and facilitate effective exploration and production of provincial mineral and coal resources. The exploration industry has a particularly critical need for the products of field mapping and related research produced by the section.

1984 HIGHLIGHTS

Field projects undertaken by Geoscience Projects in 1984 continued at a relatively low level due to reduced operating funds and hiring restraints. Three of the eight Project Geologists, A. Panteleyev, B. N. Church, and G. Ray, had significantly shortened or no field seasons. Most projects focussed on precious metal and massive sulphide potential. Activity in coal continued at the same level as last year with efforts in north central British Columbia concentrated on the Mount Klappan anthracite deposit.

Cooperative programs carried out with Applied Programs and Resource Data geologists highlighted the year's activities. In the southeast coalfield

Ward Kilby and David Grieve analysed resource potential in part of the Northern Dominion Coal Block. In the north Andre Panteleyev worked with Tom Schroeter on precious metal deposits in the Toodoggone area and Don MacIntyre worked with Tom Schroeter on massive sulphide potential in the Tatshenshini area. In the northeast Ward Kilby and Andrew Legun continued efforts to improve stratigraphic definition and correlation of the coal measures, and in the northwest Jahak Koo and Gary White assessed the Seeley Lake Prospect. Don MacIntyre and Gary White also worked together in the Dome Mountain Gold Camp near Smithers.

Interaction with post graduate students has proven fruitful. Andre Panteleyev and Tom Schroeter worked with Larry Diakow of the University of Western Ontario in the Toodoggone area, and Trygve Höy with Francoise Gautier of The University of British Columbia in a study of the metallogeny of southeastern British Columbia.

Other projects included the precious metal potential of the Harrison Lake area by Gerry Ray, the Bob Creek area near Houston by Neil Church, the Salmon River area near Stewart by Dani Alldrick, and the area around the Mount Klappan anthracite deposit by Jahak Koo.

SELECTED ACHIEVEMENTS

Andre Panteleyev and Tom Schroeter have also begun a 1:2-million-scale compilation map of gold and silver occurrences in British Columbia; their work has led to development of a genetic model of ore deposition that spans the interval from porphyry copper to epithermal vein to hot spring deposits.

Work in the Cirque, Midway, and Tatshenshini areas enabled Don MacIntyre to construct comparative models for the settings of massive sulphide deposits in northern British Columbia.

Similarly, other studies are leading toward a genetic model for precious metal deposits in the Harrison Lake (Gerry Ray) and Stewart (Dani Alldrick) areas; volcanogenic massive sulphide deposits in southern British Columbia (Trygve Höy); and skarn and other deposits in south central British Columbia (Neil Church).

In coal, the focus is on tectonic and stratigraphic setting, coal measure and coal seam correlation, and resource evaluation. Coal petrography and computer analysis are well used tools in both the northern (Jahak Koo) and northeastern (Ward Kilby) coalfield studies.

APPLIED PROGRAMS SECTION

The Applied Programs Section is responsible for monitoring and assisting the field activities of the mineral exploration industry. Geological information on exploration activities and opportunities is provided by this section to industry. The section also offers technical aid and training assistance to prospectors, exploration personnel, and developers.

The Eighth Annual Mineral Exploration Course for Prospectors was successfully held at the Cowichan Lake Forestry Research Station, April 26 to May 12, 1984 under the direction of H. P. Wilton. Thirty-one students graduated from this 15-day advanced course which was jointly sponsored by the Ministry of Education, Malaspina College, and Ministry of Energy, Mines and Petroleum Resources. In addition, nine basic prospector's courses were delivered in seven locations throughout the province in 1984.

Highlights of the 1984 field season are:

assessment of the mineral potential of the proposed Wokkpash Recreation area by A. Legun;

assessment of the mineral potential of Tweedsmuir Park by E. L. Faulkner;

assessment of the mineral potential of Syringa Creek and Deer Park proposed Ecological Reserves by G. G. Addie;

assessment of the mineral potential of Sutton Creek Ecological Reserve by H. P. Wilton.

RESOURCE DATA AND ANALYSIS SECTION

The Resource Data and Analysis Section compiles and interprets exploration and development data gathered on coal and mineral resources. This data provides an important source of information that allows government and industry to increase exploration efficiency. The section also makes assessments of mineral potential of lands before various land use dispositions, which could alienate areas from exploration, are approved, thereby helping to ensure that mineral lands are properly managed. Most of the exploration industry information collected by the section is made available to the public after a 1-year confidential period.

In 1984 the section carried or sponsored four field programs:

mineral potential evaluation of the proposed ecological reserve on the Brooks Peninsula, Vancouver Island, by W. R. Smyth;

mineral potential evaluation of the Penticton west-half map-area (NTS 82E/11) with goal of producing an updated and revised style of Mineral Deposit/Land Use Map by W. R. Smyth;

in cooperation with The University of British Columbia the section gave logistical and limited financial support to post-doctoral researcher Dr. Jennifer Pell for a study of the Economic Potential of Carbonatities and Related Intrusives in British Columbia.

The section also assisted with the preparation for publication of the Ministry's Land Use Policy.

D. Hora compiled a major review of industrial minerals in British Columbia for publication in the May 1984 issue of Industrial Minerals journal coincident with the Sixth Industrial Minerals International Congress in Toronto.

ANALYTICAL LABORATORY

The Analytical Laboratory conducts a complete range of geochemical analyses in support of the projects conducted by Branch Geologists. Some custom laboratory work is performed for various other government agencies. The laboratory is further responsible for certifying assayers in the province, and through this program controls the quality of work done by commercial mining assay laboratories.

The results of a joint Federal/Provincial Regional Geochemical Survey of the Hazelton (93M) and Takla (93N) map sheets were released in July 1984. The 93G/E and 93H/W map sheets were sampled in 1984.

There was some method development and related work done in the Laboratory during 1984. Analyses on geochemical standards and a continuation of a study of the mineralogy of the Tillicum Mountain gold deposit were performed. These studies were as follows:

continuing development of methodology for the determination of major and trace elements using X-ray fluorescence techniques by Dr. V.V.B. Vilkos;

a continuing combined field and laboratory study of the mineralogy of the Tillicum Mountain gold deposit by Dr. Y.T.J. Kwong in conjunction with Mr. G. G. Addie;

a study of the possibility of extracting titanium from the mine tailings of copper mines in the province by Dr. Y.T.J. Kwong and Mr. Z. D. Hora;

continued participation in interlaboratory standard reference material programs by Mr. B. Bhagwanani, Mr. M. A. Chaudhry, Dr. W. M. Johnson, and Mr. P. F. Ralph;

continued participation by Dr. W. M. Johnson in Canada/Japan studies on the liquefaction of British Columbia coals.

PUBLICATIONS

The work of the branch is presented to the interested public by a series of formal publications and maps, as well as by technical talks and informal discussions. Published works include the following:

INFORMATION CIRCULARS

Staff, Geological Branch: *British Columbia Mineral Exploration Review*, Information Circular 1985-1.

PAPERS

McMechan, R. D.: *Geology of the Princeton Basin*, Paper 1983-3.

Debicki, R. L.: *An Overview of the Placer Mining Industry in Atlin Mining Division*, Paper 1984-2.

Eastwood, G.E.P.: *Geology of the Quinsam Lake Area, Vancouver Island*, Paper 1984-3.

Geological Fieldwork, 1983, Paper 1984-1 contained the following papers:

Church, B. N.: Geology and Self-potential Survey of the Sylvester K Gold-Sulphide Prospect (82E/2E).
Church, B. N.: The Farleigh Lake Radioactive Occurrence (82F/13).
Addie, G. G.: Discussion of Tillicum Mountain Self-potential Test Surveys to Date (82F/13).

Addie, G. G.: Amazon Mine, Ainsworth Mining Camp (82F/15).

Höy, T.: Structural Setting, Mineral Deposits, and Associated Alteration and Magmatism, Sullivan Camp, Southeastern British Columbia (82F, G).

Grieve, D. A.: Tonsteins: Possible Stratigraphic Correlation Aids in East Kootenay Coalfields (82G/15, 82J/2).

Ray, G. E., Coombe, S., and White, G.: Harrison Lake Project (92H/5, 12; 92G/9).

Ray, G. E.: Coquihalla Gold Belt Project (92H/11, 14).

McMillan, W. J.: Report on the East Pit of the Highmont Operation (92I/7E).

Smyth, W. R.: Mineral Evaluation Study of the Cluckata Ridge Area, Taseko Lakes Map-Area (93O/3).

Koo, Jahak: The Telkwa, Red Rose, and Klappan Coal Measures in Northwestern British Columbia (93 L, M).

Schroeter, T. G.: AG Prospect (93M/7W).

Schmitt, H. R.: Regional Geochemical Surveys, Hazelton and Manson River Map-Areas (93 M, N).

Kilby, W. E.: Tonsteins and Bentonites in Northeast British Colmbia (93 O, P, I).

Kilby, W. E.: The Character of the Bluesky Formation in the Foothills of Northeastern British Columbia (93 O, P, I).

Kilby, W. E.: A Useful Micro-computer Program.

Legun, A.: Stratigraphic and Depositional Relationships between the Bluesky Marker Unit, Gething Marine Tongue, and Upper Coal Measures of the Gething Formation (93 O, P).

Legun, A.: Butler Ridge Map-Area, Peace River District (94B/1).

Schroeter, T. G.: Bill Prospect (94E/13).

Schroeter, T. G.: Toodoggone River Area (94E).

Panteleyev, A.: Stratigraphic Position of 'Toodoggone Volcanics' (94E/2, 3, 6, 7, 11, 12, 13).

Diakow, L. J.: Geology between Toodoggone and Chukachida Rivers (94E).

Legun, A.: Geologic Reconnaissance of the Wokkpash Park Proposal Area (94K).

Alldrick, D. J.: Geologic Setting of the Precious Metal Deposits in the Stewart Area (104B/1).

Alldrick, D. J. and Kenyon, J. M.: The Prosperity/Porter Idaho Silver Deposits (103P/13).

MacIntyre, D. G.: Geology of the Alsek-Tatshenshini Rivers Area (114P).

Johnson, W. M.: British Columbia Geochemical Reconnaissance Survey Data Summary.

Hora, Z. D. and Kwong, Y.T.J.: Industrial Zeolites and Rutile.

Hora, Z. D.: Industrial Minerals and Structural Materials.

REGIONAL GEOCHEMICAL SURVEY

BC RGS 10-1983 (GSC Open File 1000) Hazelton area, NTS 93M.

REGIONAL GEOCHEMICAL SURVEY DATA RELEASE

BC RGS 11-1983 (GSC Open File 1001) Takla (Manson River), NTS 93N.

BULLETINS

Fyles, James T.: *Geological Setting of the Rossland Mining Camp,* Bulletin 74.

PRELIMINARY MAPS AND NOTES

Höy, T.: Geology of the Cranbrook Sheet and Sullivan Mine Area, Preliminary Map 54, 1:50 000.

Schiarizza, P., Preto, V. A., McLaren, G. P., Diakow, L. J., and Forster, D.: Geology of the Adams Plateau-Clearwater Area, Preliminary Map 56, 1:100 000.

JOURNAL PUBLICATIONS

Church, B. N., Kowalchuk, J. M., Barakso, J. J., and Bradshaw, P.M.D.: Lithogeochemistry at the Equity Silver Mine, Western Miner, April 1984.

Höy, T., Gibson, G., and Berg, N. W.: Copper-Zinc Deposits Associated with Basic Volcanism, Goldstream Area, Southeastern B.C., Economic Geology, Volume 79, pages 789-814.

ABSTRACTS AND CONFERENCE PUBLICATIONS

The following talks were presented at the Cordilleran Geology and Exploration Round Up in January:

MacIntyre, D.: Stratigraphy and Geochemistry of the Alsek-Tatshenshini Area.

Ray, G.: Geology and Gold Mineralization, Coquihalla Belt near Hope.

Panteleyev, A., Schroeter, T. G., and Diakow, L. J.: A Review of the Toodoggone Precious Metal Project.

Alldrick, D.: Geological Setting of Mineral Deposits in the Stewart Area.

Smyth, R. W.: Preserving Mineral Lands: A Review of Mineral Land Use Projects and Problems.

Preto, V. A.: Exploration in British Columbia in 1983.

The following talks were presented at various scientific meetings throughout the year:

Church, B. N.: Multiple Phases of Mineralization in the Greenwood Area, CIM District 6 Meeting, Kamloops, October, 1984.

Church, B. N.: Tertiary Volcanic Rocks in the Okanagan, GAC Annual Meeting, London, Ontario, May, 1984.

Church, B. N.: Gravity Surveys of Southern British Columbia Tertiary Basins, Victoria Section, GAC Symposium, April, 1984.

Höy, T. and Kwong, Y.T.J.: The Mount Grace Carbonatite, a Pyroclastic Carbonatite Marble in the Shuswap Complex in Southeastern British Columbia, CIM District 6 Meeting, Kamloops, October, 1984.

Höy, T. and Panteleyev: Advances in Regional Metallogeny in the Cordillera, GAC Cordileran Section Meeting, Vancouver, February, 1984.

Monger, J.W.H. and McMillan, W. J.: Structural Evolution of the Southwestern Intermontane Belt and Adjacent Parts of the Coast Plutonic Complex, CIM District 6 Meeting, Kamloops, October, 1984.

Preto, V. A. and Dickie, G. J.: Mineral Deposits of the Adams Lake-Barriere Area, CIM Distict 6 Meeting, Kamloops, October, 1984.

Kilby, W.: Tonsteins and Bentonites in Northeastern B.C., Coal Conference, Fernie, September, 1984.

Koo, J.: Economic Coal Measures of Northwest B.C., September, 1984.

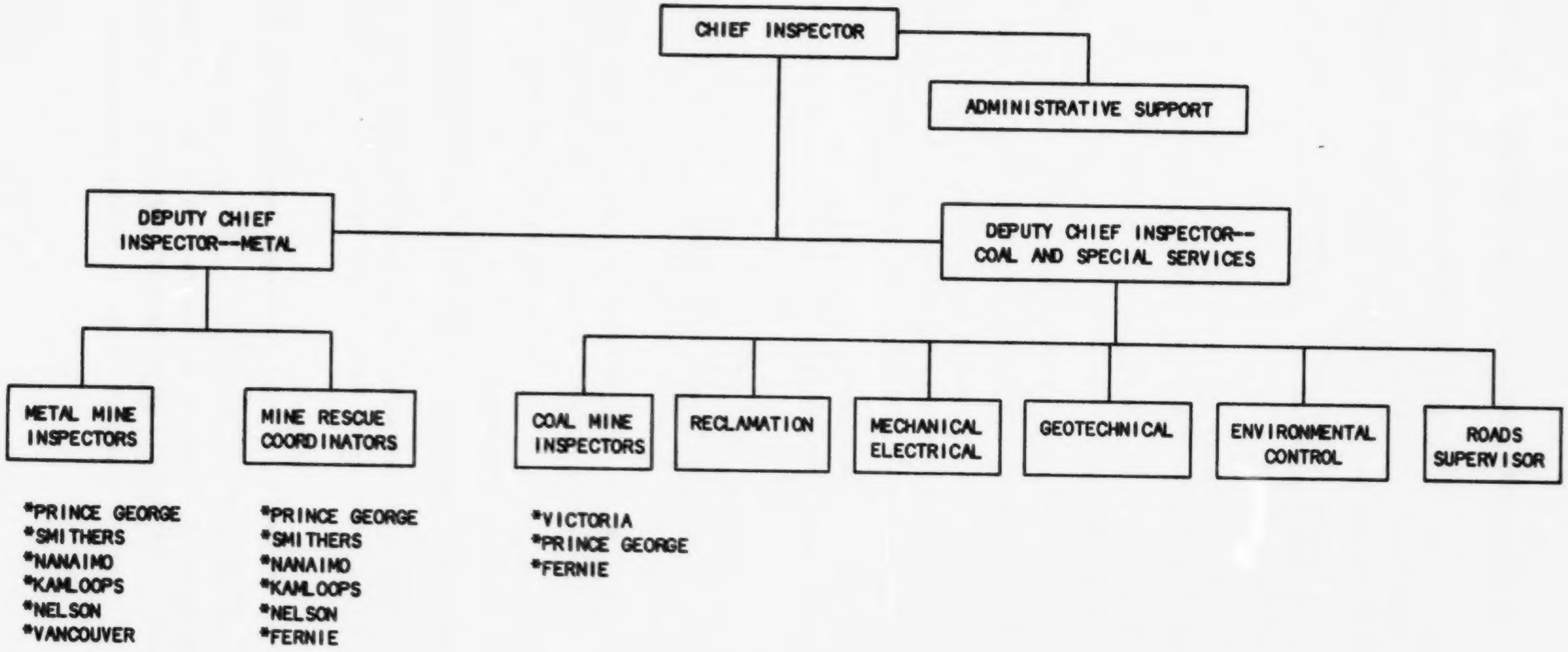
MacIntyre, D.: Comparison of Massive Sulphide Deposits in Northern B.C., Prospectors and Developers Association Meeting, Toronto, March, 1984.

Ray, G.: Mineral Potential of the Hozameen Fault System, Pacific Geoscience Centre Symposium, April, 1984.

Ray, G. and Mcdonald, J.: Fluid Inclusions as a Tool in Exploration for Gold Deposits, GAC Cordilleran Section Meeting, Vancouver, February, 1984.

TABLE 2-7. ORGANIZATION CHART

INSPECTION AND ENGINEERING BRANCH


CHIEF INSPECTOR
ADMINISTRATIVE SUPPORT
DEPUTY CHIEF INSPECTOR--METAL
DEPUTY CHIEF INSPECTOR--COAL AND SPECIAL SERVICES
METAL MINE INSPECTORS
MINE RESCUE COORDINATORS
COAL MINE INSPECTORS
RECLAMATION
MECHANICAL ELECTRICAL
GEOTECHNICAL
ENVIRONMENTAL CONTROL
ROADS SUPERVISOR
*PRINCE GEORGE
*SMITHERS
*NANAIMO
*KAMLOOPS
*NELSON
*VANCOUVER
*PRINCE GEORGE
*SMITHERS
*NANAIMO
*KAMLOOPS
*NELSON
*FERNIE
*VICTORIA
*PRINCE GEORGE
*FERNIE

BUDGET $ THOUSANDS 1984/85	MANAGEMENT	METAL INSPECTION (ALL MINES)	SPECIALIST SERVICES	BRANCH TOTAL	AUTHORIZED STAFFING LEVEL
	406.3	1 555.6	1 387.6	3 349.5	61 (FTEs)

INSPECTION AND ENGINEERING BRANCH

ORGANIZATION AND OBJECTIVES

The Inspection and Engineering Branch carries out activities to provide safe operations at all mines, to ensure worker health and safety, to ensure the suitable reclamation and conservation of land affected by mining and exploration, and to ensure that mining systems provide the maximum possible economic recovery of the province's mineral and coal resources. Most activities are required and carried out under the *Mines Act*, which was proclaimed on June 30, 1983, and the Mines Regulation and the Coal Mines Regulation which were enacted at the same time.

The branch, under the direction of Chief Inspector W. C. Robinson, is organized as shown in Table 2-7. During the year, inspectors stationed at various locations inspected coal mines, metal mines, sand and gravel pits, placer mines, and quarries in accordance with the *Mines Act* and the prescribed regulations. Specialized research and support for field inspections were provided by Victoria-based professionals in the areas of reclamation, environmental control, geotechnical engineering, mechanical/electrical engineering, and coal mining. The development and maintenance of access roads into areas of promising mineral potential were administered by a roads supervisor. Mine rescue training is a continuous program administered by coordinators for areas in which mine rescue stations are located.

STAFF

On December 31, the staff consisted of 58 1/2 permanent and 1 half-time auxiliary employee; two positions were vacant.

STAFF CHANGES

Early in 1984, the Prince George office was closed. The Inspectors were transferred March 31 to other branch offices: V. A. Pakalnis to Smithers and F.J.T. Hancock to Kamloops.

At the end of March, A. J. Richardson, Deputy Chief Inspector (Metal), resigned.

In May, H. J. Dennis, Senior Goal Inspector, resigned.

In November, J. A. Thomson, Inspector-Technician in Kamloops, retired after 16 years with the Ministry.

MINE INSPECTION AND SAFETY

It is the responsibility of the Inspection and Engineering Branch, under the provisions of the *Mines Act*, Mines Regulation, and Coal Mines Regulation, to ensure that the maximum possible recovery of natural resources from mining operations is achieved while keeping personal injury and environmental disturbance to a minimum. The branch maintains a province-wide network of district offices staffed by experienced professional personnel and supported by a team of specialist engineers based in Victoria.

Inspections are carried out at metal mines, coal mines, sand and gravel pits, placer mines, and quarries throughout the province on a regular basis by the inspection staff.

Every employee working in an underground mine or in open-pit workings is required to be under the supervision of a person holding an appropriate certificate of competency issued in accordance with the *Mines Act*. In order to obtain a certificate, a candidate has to pass an examination administered by either the coal mine or metal mine Board of Examiners. Members of these boards are appointed from branch staff and are responsible for ensuring that candidates meet the required standards of training and education.

In addition, miner's certificates and blasting certificates are issued by the Inspectors of Mines in the district offices.

The following is a review of the work of the various sections of the Inspection and Engineering Branch during the year.

COAL SECTION

MINE INSPECTION AND SAFETY

The Coal Section of the Inspection and Engineering Branch is responsible for carrying out inspections of all developing and operating coal mines and exploration sites. All fatal and non-fatal accidents are investigated, together with all reported dangerous or unusual occurrences. The investigations are made to establish the causes and make recommendations to prevent, or reduce, the occurrence of similar accidents or incidents at mines in the province. Environmental conditions at coal mines are monitored by inspectors. Special attention is paid to areas where there are likely to be noise, dust, or ventilation problems.

MINE QUALIFICATIONS

The following persons form the Board of Examiners:

V. E. Dawson, P. Eng., Deputy Chief Inspector of Mines (Coal and Special Services), Victoria

R. Bone, P. Eng., Acting Senior Inspector of Mines (Coal), Victoria

T. Vaughan-Thomas, P. Eng., Inspector of Mines and Resident Engineer, Prince George.

The board is responsible for conducting examinations for the granting of First, Second, and Third Class Certificates of Competency, Mine Surveyor Certificates, and Shiftboss Certificates issued under the *Mines Act*. Following the examinations held in the latter part of 1983, one person was awarded a First Class Certificiate. The Board of Examiners upgraded the academic requirements for applicants wishing to sit the Surveyors examination, following a review of the past requirements and the poor academic standard of applicants presenting themselves.

MINING PROJECTS

In 1984 coal production was almost double that of the previous year, at approximately 20.5 million tonnes of clean coal, mainly due to Teck Corporation's Bullmoose mine and Denison Mines Ltd.'s Quintette mine coming into full operation in the northeast coal area. The Bullmoose mine increased its production quota but the Quintette mine fell short of its scheduled tonnage due to poor mining conditions.

In the southeast, the Line Creek mine production remained steady while the Byron Creek, Fording Coal, and Westar's Balmer mines increased production. The Westar Balmer South Hydraulic mine was sealed off following major underground heating in an adjacent abandoned section of the mine. The mine had been scheduled to close within a few months, the displaced miners being transferred to the open-pit mine.

Westar's Greenhills operation doubled its production capacity by extending the mine in a northerly direction along the Greenhills Range.

A reduction in the price per tonne of coal negotiated with their Japanese customers required the mines to initiate cost-cutting measures by re-evaluating the planned mining areas and reducing manpower requirements.

ACCIDENT STATISTICS

There were two fatal accidents during the year, both at coal mines.

The combined accident statistics for underground and open-pit operations for 1984 are shown below:

TOTAL HOURS WORKED	SEVERITY RATE*	TOTAL WORK DAYS LOST
22 644 107	185	20 916

$$\text{*Severity Rate} = \frac{\text{Total days lost} \times 20\ 000}{\text{Total hour worked}}$$

NOTE: The total work days lost includes 6 000 days for each fatality occuring at a producing mine.

ENVIRONMENTAL CONTROL SECTION

The Environmental Control Section is responsible for the monitoring and maintenance of safe workings conditions in mines with respect to dust, gases, noise, and radiation.

Monitoring of dust, ventilation, and noise conditions continued at most mining operations. Where environmental conditions were found to be unsatisfactory, management was directed to take remedial action. Audiometric testing of mine employees was continued at most mining operations. Cooperation for mine management and employees has been good.

Personal gravimetric samplers were used to monitor dust at the mining operations. The filters were analysed for the mass of free silica present by the infra-red method. At the only asbestos mine in the province, the membrane filter method was used to measure the number of asbestos fibres per unit volume of air. At coal operations, personal gravimetric sampling was used to determine the mass of respirable coal dust per unit volume of air.

Ten sound surveys were performed at six gravel pits, at three underground mines, and at one open-pit mine. Approximately 90 per cent of the workers were wearing ear protection where required, all of the drills in use were muffled and with a few exceptions, all the properties surveyed were performing audiometric tests on the workers.

In 1984, about 9 200 audiograms on British Columbia mine workers were completed and put on our computerized system. Fifty-seven mining companies and contractors submitted these hearing tests.

The audiologist held 30 training courses at mines throughout the province resulting in 42 new Industrial Audiometric Technicians, and renewal of 93 Technician certificates.

GEOTECHNICAL SECTION

Geotechnical engineering section reviews assignments relating to mining such as the inspection and review for Chief Inspector's approval of tailings impoundments and waste dumps or other deposits of refuse at mining operations.

Most of the effort in 1984 was devoted to inspections of geotechnical features at minesites throughout the province. Twenty-one inspections were made at 18 mining properties. The number of geotechnical features inspected increased from 21 per year in previous years to a high of 37 in 1984. Most of the inspections were routine in nature, but some were concerned with the investigation of special problems.

In addition to the increase in inspection activity at the mines, much time was spend reviewing the geotechnical features of mining systems or mining projects which had been submitted for the approval of the Chief Inspector of Mines. Sixteen such projects were recommended for his approval. In addition, three reviews were made of other mining projects to confirm the approvals recommended by other inspectors. The number of such approvals recommended has remained much the same as in previous years.

The number of active tailings impoundments decreased again in 1984, though there were 24 impoundments active at various times during the year. It was necessary at Taurus mine near Cassiar, at Brenda mine near Peachland, and at Quintette coal mine near Tumbler Ridge to discharge on an emergency basis and/or build the containing dam rapidly to cope with the normal runoff and operating tailings discharge. The discharge from the Brenda impoundment caused some public concern but it did not result in any harm to the environment. The impoundments at the Kimberley operations of Cominco and at Mosquito Creek mine near Wells were investigated for structural problems.

Failures of large waste rock dumps in mountainous terrain were again experienced at the Fording coal mine near Elkford and also at the Quintette coal mine. In neither place did damage or injury result.

MECHANICAL-ELECTRICAL SECTION

Over 200 minesite mechanical-electrical inspections were carried out during 1984. The approval and commissioning of new equipment and systems used in the coal mines in the northwest of the province highlighted deficiencies in both mobile equipment and coal conveying systems. These deficiencies in both equipment design and operation were addressed by manufacturers and mine operators to the satisfaction of this branch.

The approval and testing of braking and steering systems on new haul trucks in conjunction with the review of annual braking tests of all large haul trucks in use in the province continued to place a heavy demand on the section.

Technical evaluation of electrical distribution systems at new mines has continued throughout the year with special attention to the H-W mine project at Buttle Lake, which includes an 8-megawatt hydro generating facility, and the extensive electrical systems at the Bullmoose and Quintette mines. The installation of the 50-kilovolt electric railway into the Northeast Coalfield and onto the Quintette minesite was also of considerable interest to the section.

RECLAMATION SECTION

In British Columbia, lands used for mining, mine waste disposal, and exploration are required to be restored to a useful purpose compatible with appropriate land-use values. The Reclamation Section is responsible for ensuring that any lands disturbed by mining are reclaimed and revegetated. The Ministry requires, prior to any surface disturbance at a worksite, that a reclamation permit be issued and a security deposit be retained to ensure satisfactory reclamation. Reclamation permits are issued by the Minister for coal mines, coal exploration properties, and metal mines. The Chief Inspector of Mines is responsible for issuing reclamation permits for sand and gravel pits, quarries, mineral exploration properties, and placer mines.

A staff of six specialist reclamation inspectors and technicians provide detailed technical review of proposed reclamation programs and undertake field inspections. A total of 678 inspections were made by reclamation staff during 1984.

The annual British Columbia Mine Reclamation Symposium was again held in 1984. One hundred and twenty delegtes heard talks on wide ranging reclamation topics. During this symposium, the British Columbia Mine Reclamation award was presented to Island Copper mine. Citations were presented to Crows Nest Resources Ltd. (Line Creek property) for coal mine reclamation, to Crows Nest Resources Ltd. (Telkwa project) for exploration reclamation, and to Equity Silver Mines Ltd. for metal mine reclamation.

The continued troubled economy in British Columbia has resulted in a large number of temporary and permanent closures of metal mines which has heightened final reclamation activity on several of these mines.

Mine Reclamation Guidelines were formally issued by the Minister on March 1, 1984.

During the year, nine applications for ministerial reclamation permits were received and issued. At year end, there were 53 metal mine permits, 9 coal mine permits, and 29 coal exploration permits. Eight applications for amendments to existing permits were processed during the year.

The metal mine properties reported a total area disturbed by mining of 13 589 hectares, of which 1 821 hectares were reclaimed. The coal mines reported a total disturbance of 6 605 hectares, of which 1 429 hectares were reclaimed. The coal exploration properties under reclamation permit reported a total disturbed area of 1 605 hectares, of which 1 081 hectares have been reclaimed.

Securities placed for performance of reclamation obligations for ministerial permits now total $8 501 000.00.

Reclamation permits issued by the Chief Inspector of Mines continued to increase this year and at year end a total of 979 permits were in existence.

A total of 291 applications was processed, 250 permits were issued, and 147 permits were closed.

Securities placed for performance of reclamation obligations for Chief Inspector's permits now total $2 657 027.05. Security was used to reclaim two properties.

MINE RESCUE AND FIRST AID

Each mine rescue station is capable of equipping one surface and two underground mine rescue teams with breathing apparatus. Major producing mines within the province maintain mine rescue equipment and suplies on site and train personnel in its use. In accordance with the *Mines Act*, the rescue facilities and training of personnel at the operating mines are monitored by the Inspection and Engineering Branch Mine Rescue Coordinators under the direction of an Inspector of Mines and Resident Engineer.

The type of training courses and the number trained, assisted, or examined by the Mine Rescue Coordinators in 1984, combined with comparable statistics for 1983, are:

	1983	1984
Underground Mine Rescue Certificates	99	52
Underground Mine Rescue (Refreshers)	47	9
Surface Mine Rescue Certificates	277	290
Surface Mine Rescue (Refreshers)	69	24
Survival Mine Rescue Certificates	379	376
Gravel Pit Mines Rescue Certificates	22	28
St. John Standard First Aid	250	256
Safety Oriented First Aid	174	63
Underground Mine Rescue Instructor's Certificates	1	3
Surface Mine Rescue Instructor's Certificates ...	5	5
Survival Mine Rescue Instructor's Certificates ..	3	1

MINE SAFETY ASSOCIATIONS

The four mine safety associations established throughout the province are again commended for their efforts in promoting mine rescue, first aid training, and safety education with their respective zones. The associations are:

Vancouver Island Mine and Industrial Safety Association;

Central British Columbia Mine Safety Association;

East Kootenay Mine and Industrial Safety Association; and

West Kootenay Mine and Industrial Safety Association.

The associations are sponsored by grants from the Ministry of Energy, Mines and Petroleum Resources and the Workers' Compensation Board. The association members consist of representatives from industry, the Inspection and Engineering Branch, the Workers' Compensation Board, and St. John Ambulance. One of the important functions of each association is to organize and run the zone mine rescue and first aid competitions.

The winners of various zones went on to compete in the provincial competition in Kamloops on June 23, 1984. Zone winners were:

ASSOCIATION	UNDERGROUND	OPEN PIT	THREE-PERSON FIRST AID
Vancouver Island Mine and Industrial Safety Association	Westmin Res. Ltd. Captain— D. Glaeser	No Entry	No Entry
Central B.C. Mine Safety Association			
--North Zone	No Entry	Quintette coal mine Captain--H. Latreille	Gibraltar Mines Ltd. Captain—L. Walley Equity Silver Mines Ltd. Captain—M. Jeffrey
--South Zone	Teck Corporation Beaverdell Captain—T. Richards	Utah Mines Ltd. (Island Copper mine) Captain--J. Pelletier	Newmont Mines Ltd. Similkameen Division Captain—W. Wallace
--Central Zone	No Entry	Highmont Operating Corp. Captain--B. Duncan	Lornex Mining Corp. Captain—J. Horvath
West Kootenay Mine and Industrial Safety Association	Cominco Ltd. (Sullivan mine) Captain—R. Gyurkovits	No Entry	No Entry
East Kootenay Mine and Industrial Safety Association	Wester Mining Ltd. Balmer Operation Captain--E. Taje	Wester Mining Ltd. Balmer Operation Captain--E. Hingston	Cominco Ltd. (Sullivan mine) Captain--M. Boisvert

In addition to the above zone winners, a guest underground mine rescue team from Kellog, Idaho participated in the provincial underground event on a non-competing basis. The American Smelting & Refining Co. (Coeur mine) was captained by Mr. Dave Turcotte.

The surface and underground mine rescue competitions were judged by personnel of the Inspection and Engineering Branch. The three-person first aid event was judged by St. John Ambulance personnel.

The winners of the provincial mine rescue and three-person first aid event were as follows:

UNDERGROUND	OPEN PIT	THREE-PERSON FIRST AID
Cominco Ltd. Sullivan mine Captain—R. Gyurkovits	Utah Mines Ltd. Island Copper mine Captain--J. Pelletier	Cominco Ltd., Sullivan mine Captain—M. Boisvert

MINING ROADS

Under the authority of the *Ministry of Energy, Mines and Petroleum Resources Act*, the road maintenance program was carried out to encourage and assist in the development of mineral resources in the province.

During 1984, expenditures of $110 000 were made to provide annual general maintenance to the Omineca Road and limited maintenance of the Takla Spur access road.

Due to budgetary restraints, the shared-cost road grant program to assist in construction or maintenance of roads or trails to mining properties was not supported in 1984.

The Ministry of Energy, Mines and Petroleum Resources entered into a shared-cost agreement with Serem Inc. to review a route for possible extension of the Omineca Road from Moose Valley to the Lawyers gold-silver project. The total cost of this project was $11 830.

MINERAL POLICY AND EVALUATION BRANCH

OBJECTIVES AND ORGANIZATION

The branch was re-organized in 1984 to encompass two distinct groups: a Mineral Policy and Analysis Group and a Project Evaluation Group.

The functions of the **Mineral Policy and Analysis Group** are the provision of economic, financial, and statistical analyses pertaining to provincial mineral sector policy, legislation and planning, and the collection, maintenance, and dissemination of comprehensive statistical data in support of Ministry resource management responsibilities. The group has three subgroups whose objectives are as follows:

The **Mineral Policy Group** provides expertise on the economic aspects of mineral sector policy and planning, including assistance on the formulation of incentive programs, infrastructure support programs, taxation, and tenure systems, appropriate evaluation frameworks, and provincial and inter-provincial mineral policies.

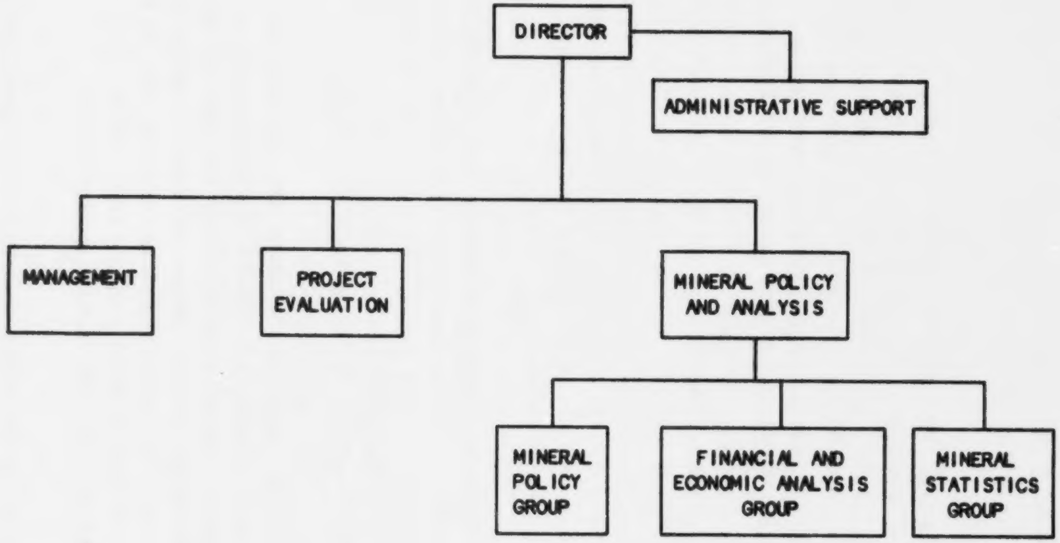
The **Financial and Economic Analysis Group** performs selected mineral industry economic analyses including marketing, supply, financial, economic, and fiscal evaluations of mineral projects and government programs; environmental and socio-economic assessment; and medium to long-term forecasts.

The **Mineral Statistics Group** undertakes the collection, maintenance, and dissemination of comprehensive British Columbia mineral industry statistics for use by the branch, the Ministry, and other users. These include producing metal, coal, industrial minerals, structural materials, and placer operations, and associated production, sales, and values of commodities produced from these operations.

The **Project Evaluation Group** provides coordination services and administrative support for implementing the province's main review process for new mines: the *Guidelines for Mine Development*. Through the review process, the group identified potential environmental, social, and economic impacts, and makes plans for adequate impact management to facilitate publicly acceptable mine development in British Columbia.

TABLE 2-8. ORGANIZATION, MANPOWER, AND BUDGET

MINERAL POLICY AND EVALUATION BRANCH, 1984


DIRECTOR
ADMINISTRATIVE SUPPORT
MANAGEMENT
PROJECT EVALUATION
MINERAL POLICY AND ANALYSIS
MINERAL POLICY GROUP
FINANCIAL AND ECONOMIC ANALYSIS GROUP
MINERAL STATISTICS GROUP

				BRANCH TOTAL
STAFF	3	2	5	10
BUDGET ($000)				
1984/85	$100.5	$103.6	$218.6	$422.7

STAFF AND STAFF CHANGES

The branch is under the direction of Mr. Frank C. Basham who returned in October 1983 after a two-year posting at the Canadian High Commission in Canberra, Australia as Counseller (Metals, Minerals and Energy).

1984 saw a retirement from the branch; Keith Dornan retired from the Mineral Statistics Group after some 34 years of service with the Provincial Government. His position has not been filled.

During the summer of 1984, Barbara MacDonald returned on contract to the branch to work on the backlog on editing and auditing of the 1983 monthly survey of mines data.

The remainder of the permanent staff of the branch was unchanged during 1984. A summary of branch organization, manpower, and budget for 1984 is as shown in Table 2-8.

REVIEW OF ACTIVITIES

The functions of the four groups and subgroups in the branch are summarized in Table 2-9. Major activities of the branch during the year were as follows:

FINANCIAL AND ECONOMIC ANALYSIS GROUP

The **Financial and Economic Analysis Group** carried out numerous research studies and evaluations of new coal and metal-mining projects. Major projects during the year included:

In depth mineral sector economic and market analyses such as reporting on the British Columbia Mineral Sector Current Conditions and Outlook, the preparation of mineral price and production forecasts, review and outlook of world metal markets, competitive position of British Columbia copper producers, long-term mineral supply forecast of major British Columbia minerals, etc.

Financial analysis and mineral taxation studies such as the preparation of tax revenue forecasts, Highland Valley industrial tax sharing study, a pre-feasibility study of portable custom milling, a preliminary economic review of the Serem gold/silver projects, etc.

Table 2-9
MINERAL POLICY AND EVALUATION BRANCH

MINERAL POLICY	ECONOMIC AND FINANCIAL ANALYSIS	MINERAL STATISTICS	PROJECT EVALUATION
Analytical support on emerging issues pertinent to provincial mineral sector development, opportunities, and problems	Financial and economic studies of the provincial and international mineral sectors to facilitate the development of policy options and to assist in economic decision making	Collection, compilation, and analysis and dissemination of monthly and annual statistics for the sector	Review of new coal and metal-mining projects, and major modifications to existing mines
Information and analysis of provincial, federal and international developments for dissemination and inclusion in policy papers, briefing materials, and Cabinet Submissions	Evaluation of new coal and metal-mining projects to support the Ministry's coal and metal mine approval systems	Provision of statistical support for branch, division, and ministry	Processing of approvals-in-principle for mining ventures (4 completed in 1984)
Development of policy options, impact analysis, and program evaluation framework	Performance of commodity studies	Publication of quarterly bulletin of mineral statistics	Combining of the two original review procedures for mines (Guidelines for Coal Development and Procedures for Obtaining Approval of Metal Mine Development) into the Guidelines for Mine Development
Liaison with federal and provincial governments on mineral development initiatives	Production and price forecasts for the provincial mineral sector	Assembly of statistical material for the ministry annual report	Critical evaluation of provincial legislative and regulatory requirements for mining, in cooperation with other Division staff, partly under ELUTC sponsorship
	Analysis of fiscal and tax measures on the mining sector		

Reviews, briefings, and strategy on various aspects of mineral sector development, such as Cominco's lead moderization, costs recovery of the Mineral Resources Division including the cost of mine inspection by the British Columbia Government, etc.

MINERAL POLICY GROUP

The **Mineral Policy Group** continued to provide analytical support, investigation, and policy advice on current policy, legislative, and regulatory matters concerning the province's mineral sector. During 1984, these include:

Policy and economic analysis leading to more efficient management of mineral resources in the province, including a review of mine reclamation bonding, initiation of projects to be considered under the proposed Federal/Provincial mineral development subsidiary agreement; development of Ministry strategy on revenue collection, comparisons of incentive programs in mining, etc.

Planning studies on issues of multi-sector impacts, for example, a resource road policy, the closure of Granduc and its impact on the Stewart-Stikine area, a snow removal grant to Scottie Gold Mines Ltd., the Mining Association of British Columbia brief on taxation and economic development, etc.

Cabinet submissions on policy issues of pertinent, long-term concern to British Columbia, for example, the disposition of the Dominion Coal Blocks, reviews and amendments to mineral-related legislation and regulations, provincial positions on the issues of uranium moratorium, offshore minerals, etc.

Extensive reporting and briefing on certain current matters as Mines Ministers' Conferences, Western Premiers' Conference, briefings for various mining-related trade missions, Ministry annual report and summary of operations, and speeches for senior management, etc.

MINERAL STATISTICS GROUP

During 1984, the **Mineral Statistics Group** carried out its regular function--undertaking mineral statistical surveys, collection, editing, compilation, and dissemination of all mineral production activity and data for the province on a monthly and annual basis. Much of the data that are generated by the group is shared with Statistics Canada and the Department of Energy, Mines and Resources, Ottawa. Staff in the group participate regularly in joint consultative efforts with other governments to streamline the data collection process and to improve the accuracy and validity of the mineral statistics. Monthly metal-mine surveys have been computerized back to 1981; this led to greatly increased accuracy and timeliness of statistical reports.

Publication of the *B.C. Mineral Quarterly*, which contains key current and forecast indicators of performance of the mining industry, continued in 1984; it was widely distributed.

PROJECT EVALUATION GROUP

During the year, the ELUC and the ELUTC approved major changes to the review processes for mines. Most importantly, the two previous proceses (the *Coal Guidelines Review Process* and the *Metal Mines Guidelines Review Process*) were combined into a single unified *Mine Development Review Process*. Other important changes included the scheduling of an approval-in-principle decision at the end of Stage I for all projects and the adoption of a policy of greater custom-tailoring of individual reviews (with respect to both study terms of reference and involvement of agencies in reviews).

During 1984, approvals-in-principle were granted for: extensions or expansions of two existing coal mines (Line Creek and Sparwood operations); one new coal project (Sage Creek), and one small industrial minerals project (Lussier Gypsum).

Project Evaluation staff also became heavily involved in several deregulatory initiatives, including amendments to tenure and regulatory legislation and an investigation of overlapping agency jurisdictions at minesites.

BUDGET AND STAFF

The budget for the Mineral Policy and Evaluation Branch in 1984 was $422 700. The branch staff in 1984 consisted of 10 full-time equivalent (FTE) positions.

MINERAL TITLES BRANCH

ORGANIZATION AND OBJECTIVES

The Mineral Titles Branch of the Mineral Resources Division is under the direction of the Chief Gold Commissioner and is responsible for the administration of provincial laws relating to the acquisition of and maintenance of tenure for minerals and coal.

Branch activities can be summarized as follows:

- responsible for the issuance and management of all mineral, placer, and coal title records;
- develop and prepare appropriate mining titles legislation;
- resolve title disputes;
- provide claim map service and information;
- provide claims inspection service;
- maintain current mineral record information through 23 district offices; and
- provide prospector education material and lectures.

REVENUE AND BUDGET

The branch was responsible for collection of $6 942 716.46 from lode and placer fees and receipts, and $2 816 773.46 from coal fees and rentals.

The branch budget in 1984 was $1 189 193.00.

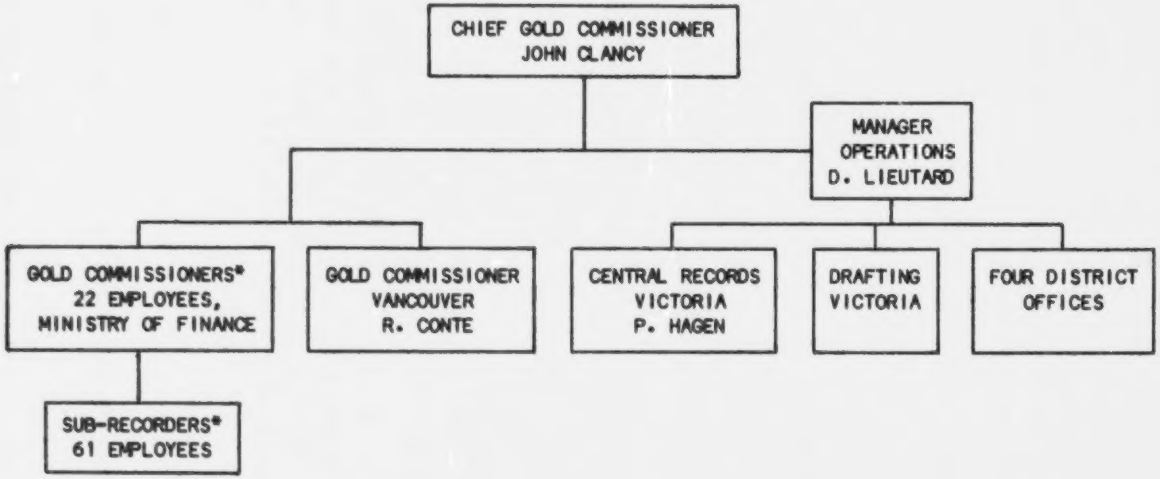
ORGANIZATION AND FUNCTION

The organization, manpower, and details of the branch in 1984 are shown in Table 2-10.

The Mineral Titles Branch, under the direction of the Chief Gold Commissioner, is responsible for administration of provincial laws and regulations relating to acquisition and maintenance of tenure for minerals and coal. Gold Commissioners and Sub-recorders are appointed for 24 mining divisions throughout the province (Table 2-11). Staking

Table 2-10. ORGANIZATION, MANPOWER, AND BUDGET

MINERAL TITLES BRANCH


CHIEF GOLD COMMISSIONER
JOHN CLANCY
MANAGER
OPERATIONS
D. LIEUTARD
GOLD COMMISSIONERS*
22 EMPLOYEES,
MINISTRY OF FINANCE
GOLD COMMISSIONER
VANCOUVER
R. CONTE
CENTRAL RECORDS
VICTORIA
P. HAGEN
DRAFTING
VICTORIA
FOUR DISTRICT
OFFICES
SUB-RECORDERS*
61 EMPLOYEES

STAFF:	MINERAL OPERATIONS	VANCOUVER	DISTRICT OFFICE	MANAGEMENT	BRANCH TOTAL
PERMANENT	20	10	4	3	37
PERMANENT VACANT	1	1	0	0	2
ACTING/SUBSTITUTE	2	1	0	0	3
BUDGET 84/85 $	542 392	252 796	182 393	211 612	1 189 193

*BY STATUTE SECTION 56(2) MINERAL ACT, THESE EMPLOYEES UNDER GENERAL SUPERVISION OF CHIEF GOLD COMMISSIONER.

and all work on mineral claims and placer leases must be recorded at the Gold Commissioner's office in the division where the claim or lease is located. The statistics for the Gold Commissioner's offices are shown in Table 2-11.

VICTORIA AND VANCOUVER RECORDS OFFICES

Copies of recorded mineral claims are forwarded bi-monthly to the Chief Gold Commissioner's office in Victoria; information concerning claims and leases can be obtained from this office, from the division where the property is located, or from the Mineral Titles Office in Vancouver, which maintains a duplicate record system.

Maps and records showing approximate positions of mineral claims may be viewed by the public at the Gold Commissioner's or Ministry offices. Prints of titles maps for the entire province may be obtained in Victoria and Vancouver.

In 1984, the branch received 2 355 applications for placer leases in designated placer areas. There were 27 requests for designation of additional placer mining areas during this period.

Also in the branch, the Coal Administrator is responsible for reviewing applications for coal licences and leases, and maintaining and recording coal titles records.

The branch is currently embarked on a pilot project to computerize titles information from the Victoria and Liard Mining Divisions. Computerization of Mineral Titles Reference Maps is also underway. These projects are scheduled to continue until the entire provincial Gold Commissioner's network has been computerized; completion is scheduled for 1987.

Mineral Claims Inspectors are based at Kamloops, Smithers, and Nelson. Their duties include checking the locations of mineral claims to correlate them with the plotted positions of the claims, determining the validity of staking under the *Mineral Act* and *Mining (Placer) Act* and Regulations, investigation of possible misuse of mineral claims, and investigations of disputes. In order to fulfill the objectives of providing claim-holders with firm titles, and maintaining accurate and up-to-date records, the activities of the inspectors have increased with the use of the modified grid system and also as a result of the continued high volume of applications for placer leases.

Table 2-11. GOLD COMMISSIONER'S OFFICE STATISTICS

MINING DIVISION	FREE MINER CERTIFICATES		LODE MINING					PLACER MINING				REVENUE		
	Individual	Company	Mineral Claim Units	Recording Fee for Work $	Cash in Lieu and Lease Rentals $	Documents Recorded $	Mining Leases	Leases Issued	Recording Fees for Work $	Cash Payments $	Documents Recorded $	Free Miner Certificates $	Mining Receipts $	Total $
Alberni	60	1	6 636	43 010	34 416	10 993	—	—	—	5 800	—	2 000	121 599	123 599
Atlin	210	6	5 033	79 405	33 588	2 560	—	309	33 100	11 100	3 290	8 250	204 538	212 788
Cariboo	819	12	10 262	141 265	35 806	8 810	—	1 235	127 950	300	8 350	28 475	471 041	497 516
Clinton	51	1	1 934	68 565	21 774	2 326	1	40	3 200	1 200	90	1 775	108 725	110 500
Fort Steele	230	5	3 629	56 920	18 824	2 132	1	60	8 050	250	266	8 250	109 737	117 987
Golden	52	2	1 457	7 150	15 437	656	—	1	50	850	20	2 300	30 918	33 218
Greenwood	100	6	1 037	36 550	16 776	3 184	—	14	1 550	1 150	70	5 500	65 145	70 645
Kamloops	285	12	6 173	131 695	100 894	10 784	—	10	1 500	3 900	20	13 125	277 608	290 733
Liard	39	—	2 765	147 170	143 794	5 466	—	153	11 250	2 100	1 450	975	337 565	338 540
Lillooet	79	3	3 231	24 500	25 474	1 948	—	55	3 300	—	260	3 475	77 587	81 062
Nanaimo	129	4	2 077	57 880	41 280	4 094	—	—	50	—	—	5 225	116 689	121 914
Nelson	201	8	1 375	50 665	41 582	5 246	—	27	1 900	—	40	9 025	108 198	117 223
New Westminster	470	13	2 924	34 640	17 344	2 764	—	91	5 150	—	490	18 250	81 378	99 628
Nicola	57	—	880	20 740	14 390	1 292	—	—	—	2 700	—	1 425	40 822	42 247
Omineca	173	4	6 421	178 120	120 220	16 569	—	109	11 800	—	1 000	6 325	368 144	374 469
Osoyoos	126	6	1 167	28 850	60 230	2 888	—	1	—	300	—	6 150	97 873	104 023
Revelstoke	87	3	3 726	54 605	26 906	2 334	—	27	3 350	300	200	3 675	108 215	111 890
Similkameen	114	4	1 290	21 715	21 464	2 232	—	127	10 650	—	700	4 850	72 401	77 251
Skeena	65	2	4 325	66 895	105 438	7 480	—	1	950	—	10	2 625	202 468	205 093
Slocan	101	9	3 340	55 845	33 634	7 462	—	—	100	—	—	7 025	113 741	120 766
Trail Creek	37	1	221	2 290	4 400	400	—	2	150	—	—	1 425	8 485	9 910
Vancouver	10 446	437	916	21 705	95 620	1 360	—	—	—	—	—	479 650	133 265	621 915
Vernon	231	6	2 070	37 280	25 834	2 339	—	10	13 200	—	30	8 775	89 733	98 508
Victoria	444	96	2 328	32 410	14 740	2 382	—	83	5 650	600	1 220	59 100	94 418	153 518
TOTALS 1984	14 606	641	75 217	1 397 870	1 029 865	107 701	2	2 355	242 900	30 550	17 506	685 650	3 440 293	4 125 943
TOTALS 1983	10 256	1 088	106 683	876 600	976 692	88 750	1	945	178 450	39 600	9 850	766 675	3 436 121	4 202 796

During 1984, as a result of 98 complaints under Section 50 of the *Mineral Act*, 94 mineral claims were cancelled.

COAL

The Coal Administrator is responsible to the Chief Gold Commissioner for administration of the *Coal Act*. This involves reviewing applications for coal licences and leases and maintenance of records of title.

Statistics related to coal licences for 1984 are shown in Table 2-12.

Table 2-12

STATISTICS FOR COAL LICENCES, 1984

Number of coal licence applications	227
Approximate areas of coal licence applications	54 599 hectares
Number of coal licences issued	142
Approximate areas of coal licences issued	38 108 hectares
Annual rental	$2 681 750.00
Application fees	$ 3 750.00
Cash in lieu of work	$112 398.46
Miscellaneous fees	$18 875.00
Total	$2 816 773.46

GOLD COMMISSIONERS

Gold Commissioners and Sub-recorders are appointed for the 24 mining divisions throughout the province and their duties are specified in writing by the Chief Gold Commissioner (Table 2-13).

Table 2-13

GOLD COMMISSIONERS

MINING DIVISION	TELEPHONE NUMBER	ADDRESS	NAME
Alberni	724-9203	4515 Elizabeth St., Port Alberni V9Y 6L5	G. Mundell
Atlin	651-7577	Box 100, Atlin V0W 1A0	P. Welock
Cariboo	992-4234	102, 350 Barlow Ave., Quesnel V2J 2C1	R. Campbell
Clinton	459-2268	Box 70, Clinton V0K 1K0	F. Westergaard
Fort Steele	489-3521	102 - 11th Ave. South, Cranbrook V1C 2P2	W. Anderson
Golden	344-5221	Box 39, Golden V0A 1H0	J. Olson
Greenwood	442-5444	Box 850, Grand Forks V0H 1H0	S. Matsuo
Kamloops	828-4547	Court House, Kamloops V2C 1E5	W. Poohachoff
Liard	387-4417	Room 412, 617 Government St., Victoria V8V 1X4	P. Hogan
Lillooet	256-7548	Court House, Bag 700, Lillooet V0K 1V0	B. Hall
Nanaimo	755-2200	Court House, Nanaimo V9R 5J1	B. Hansen
Nelson	352-2211	310 Ward St., Nelson V1L 5S4	R. McParlon
New Westminster	525-0375	100, 635 Columbia St., New Westminster V3M 1A7	G. Townsend
Nicola	378-6141	Box 339, Merritt V0K 2B0	P. Lean
Omineca	847-7207	Bag 5000, Smithers V0J 2N0	D. McMillan
Osoyoos	493-1719	Room 112, Court House, Penticton V2A 5A5	J. Bodard
Revelstoke	837-3222	Box 380, Revelstoke V0E 2S0	J. Torrance
Similkameen	295-6957	Box 9, Princeton V0X 1W0	L. Marshall
Skeena	627-0414	Court House, Prince Rupert V8J 1B7	V. Finnigan
Slocan	353-2219	Box 580, Kaslo V0G 1M0	J. James
Trail Creek	362-7324	Box 910, Rossland V0G 1Y0	A. Sherwood
Vancouver	660-2672	800 Hornby St., Vancouver V6Z 2C5	R. Conte
Vernon	545-2387	Court House, Vernon V1T 4W5	N. Schulz
Victoria	387-4417	Room 412, Douglas Building, Victoria V8V 1X4	P. Hagen

CLAIMS INSPECTORS

Quesnel	992-5591	Room 213, 350 Barlow Ave., Quesnel V2J 2C1	E. Leneve
Kamloops	554-1445	212, 2985 Airport Dr., Kamloops V2B 7W8	H. Turner
Nelson	354-6134	403 Vernon St., Nelson V1L 4E6	D. Moule

MINERAL RESOURCES STATISTICS

CHAPTER 3

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INTRODUCTION

The statistics of the mineral industry are collected, compiled, and tabulated for this report by the Mineral Policy and Evaluation Branch of the Mineral Resources Division.

In the interests of uniformity and to avoid duplication of effort, beginning with the statistics for 1925, Statistics Canada and the provincial ministries have cooperated in collecting and processing mineral statistics.

Producers of metals, industrial minerals, structural materials, coal, and petroleum and natural gas are requested to submit returns in duplicate on forms prepared for use by the province and by Statistics Canada.

As far as possible, both organizations follow the same practice in processing the data. The final compilation by Statistics Canada is usually published considerably later than the Annual Report of the Ministry of Energy, Mines and Petroleum Resources for British Columbia. Differences between the values of production published by the two organizations arise mainly because Statistics Canada uses average prices considered applicable to the total Canadian production, whereas the British Columbia mining statistician uses prices considered applicable to British Columbia production.

Peat, classified as a fuel by Statistics Canada, is not included in the British Columbia statistics of mineral production, being regarded as neither a fuel nor a mineral.

The statistics of the petroleum industry are collected, compiled, and tabulated for this report by the Petroleum Resources Branch. They are included here for comparative purposes.

METHODS OF COMPUTING PRODUCTION

The tabulated statistics are arranged to facilitate comparison of the production records for the various mining divisions, and from year to year. From time to time, revisions have been made to figures published in earlier reports as additional data became available or errors became known.

Data are obtained from the certified returns made by the producers of metals, industrial minerals and structural materials, and coal, and are augmented by data obtained from custom smelters. For petroleum, natural gas, and liquid by-products, production figures supplied by the Petroleum Resources Branch of the Ministry of Energy, Mines and Petroleum Resources are compiled from the monthly disposition reports and the Crown royalty statement filed with the Ministry by the producers.

Values are in Canadian funds. Metric weights are used throughout.

METALS

AVERAGE PRICES

The prices used in the valuation of current and past production of gold, silver, copper, lead, and zinc are shown in the table on pages 79 and 80.

Prior to 1974 the price of gold used was the average Canadian Mint buying-price for fine gold.

The price used for placer gold originally was established arbitrarily at $17 per ounce, when the price of fine gold was $20.67 per ounce. Between 1931 and 1962 the price was proportionately increased with the continuously changing price of fine gold. Since 1962, Canadian Mint reports giving the fine-gold content have been available for all but a very small part of the placer gold produced, and until 1973 the average price listed is derived by dividing ounces of placer gold into total amount received. Starting in 1974 the price used for the valuation of gold, lode and placer, is the amount received by the producer.

Prior to 1949 the prices used for silver, copper, lead, and zinc were the average prices at the markets indicated in the table on pages 79 and 80 converted into Canadian funds. The abbreviations in the table are Mont. = Montreal; N.Y. = New York; Lon. = London; E. St. L. = East St. Louis; and U.S. = United States.

Starting in 1949 the price of silver, copper, lead, and zinc were average United States prices converted into Canadian funds. Average monthly prices were supplied by Statistics Canada from figures published in the Metal Markets section of Metals Week. Specifically, for silver it was the New York price; for lead it was the New York price; for zinc it was the price at East St. Louis of Prime Western; for copper it was the United States export refinery price. Commencing in 1970 the copper price is the average of prices received by the various British Columbia shippers and since 1974 this applies also to gold, silver, lead, zinc, and cadmium.

For antimony and bismuth the average producers' price to consumers is used. For nickel the price used is the Canadian price set by Inco Limited. The value per tonne of the iron ore used in making pig iron at Kimberley was an arbitrary figure, being the average of several ores of comparable grade at their points of export from British Columbia.

GROSS AND NET CONTENT

The gross content of a metal in ore, concentrate, or bullion is the amount of the metal calculated from an assay of the material, and the gross metal contents are the sum of individual metal assay contents. The net contents are the gross contents less smelter and refinery losses.

In past years there have been different methods used in calculating net contents, particularly in the case of one metal contained in the concentrate of another. The method established in 1963 is outlined in the following table. For example, the net content of silver in copper concentrates is 98 per cent of the gross content, of cadmium in zinc concentrates is 70 per cent of the gross content, etc. Commencing in 1974 the quantities represent the actual net quantities of metals paid for.

	LEAD CONCENTRATES Per Cent	ZINC CONCENTRATES Per Cent	COPPER CONCENTRATES Per Cent	COPPER-NICKEL CONCENTRATES Per Cent	COPPER MATTE Per Cent
Silver	98	98	98	--	--
Copper	Less 26 lb./ton	—	Less 10 lb./ton	85	Less 10 lb./ton
Lead	98	50	--	--	50
Zinc	50	90	--	--	--
Cadmium	--	70	--	--	--
Nickel	--	—	—	88	--

VALUE OF PRODUCTION

For indium, iron concentrate, mercury, molybdenum, rhenium, and tin the value of production is the amount received by the shippers.

For gold, silver, copper, lead, zinc, antimony, bismuth, cadmium, some iron concentrate, and nickel the value of production was calculated from the assay content of the ore, concentrate, or bullion less appropriate smelter losses, and an average price per unit of weight. Since 1974 the values represent the settlement values received by the producers for the respective metals.

Prior to 1925 the value of gold and copper produced was calculated by using their true average prices and, in addition, for copper the smelter loss was taken into account.

The value of other metals was calculated from the gross metal content of ores or concentrates by using a metal price which was an arbitrary percentage of the average price, as follows: silver, 95 per cent; lead, 90 per cent; and zinc, 85 per cent.

It is these percentages of the average price that are listed in the table on pages 79 and 80.

For 1925 to 1973 the values had been calculated by using the true average price (see pages 79 and 80) and the net metal contents in accordance with the procedures adopted by Statistics Canada and the Ministry of Energy, Mines and Petroleum Resources.

Since 1974 the total quantity and value of metal production include the quantities paid for to the mines, and the smelter and refinery production that can be attributed to the mines but is not paid for. The quantity and value paid for to the mines, excluding outward transportation costs, smelting and refining costs, penalties and deductions, are shown separately for comparative purposes.

INDUSTRIAL MINERALS AND STRUCTURAL MATERIALS

The values of production of industrial minerals and structural materials are approximately the amounts received at the point of origin.

COAL

The value of production of coal is calculated using a price per tonne which is the weighted average of the f.o.b. prices at the mine for the coal sold.

PETROLEUM AND NATURAL GAS

The values of production of natural gas, natural gas liquid by-products, and petroleum including condensate/pentanes plus are the amounts received for the products at the well head.

NOTES ON PRODUCTS LISTED IN THE TABLES

Antimony--Antimony metal was produced at the Trail smelter from 1939 to 1944; since 1944 it has been marketed alloyed with lead. The antimony is a by-product of silver-lead ores. In 1907 the first recorded antimonial ore mined in British Columbia was shipped from the Slocan area to England. Since then other out-of-province shipments have originated in the Bridge River, North Lardeau, Slocan, Spillimacheen, and Stuart Lake areas. In Table 3-7C the antimony assigned to individual mining divisions is the reported content of ore exported to foreign smelters; the antimony "not assigned" is that recovered at the Trail smelter from various ores received there. *See* Tables 3-1, 3-3, and 3-7C.

Arsenious Oxide--Arsenious oxide was recovered at foreign smelters from arsenical gold ores from Hedley between 1917 and 1931, and in 1942, and from the Victoria property on Rocher Deboule Mountain in 1928. No production has been recorded since 1942. *See* Tables 3-1 and 3-7D.

Asbestos--British Columbia has produced asbestos since 1952 when the Cassiar mine was opened. All British Columbia production consists of chrysotile from the Cassiar mine near the Yukon boundary. This deposit is noted for its high percentage of valuable long fibre and for the low iron content of the fibre. The original claims were located at Cassiar in 1950, and the first fibre was shipped two years later. The fibre is milled from the ore at Cassiar and now most is shipped by truck to Stewart. From 1953 to 1961 the fibre was valued at the shipping point in North Vancouver, but beginning in 1962 it has been valued at the mine, and values for the preceding years have been recalculated on that basis. *See* Tables 3-1, 3-3, and 3-7D.

Barite--Barite production began in 1940 and has been continuous since then, coming from several operations in the upper Columbia River valley. Some barite has been mined from lode deposits and the rest recovered from the mill-tailings ponds of the former Silver Giant and Mineral King silver-lead-zinc mines. *See* Table 3-7D.

Bentonite--Small amounts of bentonite were produced between 1926 and 1944 from deposits in the coal measures near Princeton. There has been no production since 1944. *See* Tables 3-1 and 3-7D.

Bismuth--Since 1929 the Trail smelter has produced bismuth. It is a by-product of lead refining and thus the production cannot be assigned to specific properties or mining divisions. *See* Tables 3-1, 3-3, and 3-7C.

Brick--See Clay and Shale Products.

Building Stone--Dimensional stone for building purposes is quarried when required from a granite deposit on Nelson Island and an andesite deposit on Haddington Island. Other stone close to local markets is quarried periodically or as needed for special building projects. *See* Tables 3-1, 3-3, and 3-7E.

Butane--Butane is recovered as a by-product at the gas-processing plant at Taylor and at oil refineries. *See* Tables 3-1, 3-3, and 3-7A.

Cadmium--Cadmium has been recovered as a by-product at the Trail zinc refinery since 1928. It occurs in variable amounts in the sphalerite of most British Columbia silver-lead-zinc ores. In Table 3-7C the cadmium assigned to individual mining divisions is the reported content of custom shipments to the Trail and foreign smelters; that "not assigned" is the remainder of the reported estimated recovery at the Trail smelter from British Columbia concentrates. *See* Tables 3-1, 3-3, and 3-7C.

Cement--Cement is manufactured from carefully proportioned mixtures of limestone, gypsum, and other mineral materials. It has been produced in British Columbia since 1905. Present producers are Inland Cement Industries Ltd., with a 907 180-tonnes-per-year plant on Tilbury Island, and Canada Cement Lafarge Ltd., with a 476 000-tonnes-per-year plant on Lulu Island and a 191 000-tonnes-per-year plant at Kamloops. *See* Tables 3-1, 3-3, and 3-7E.

Chromite--Two shipments of chromite are on record, 608 tonnes from Cascade in 1918 and 114 tonnes from Scottie Creek in 1929. *See* Tables 3-1 and 3-7C.

Clay and Shale Products--These include brick, blocks, tile, pipe, pottery, lightweight aggregate, and pozzolan manufactured from British Columbia clays and shales. Common red-burning clays and shales are widespread in the province, but better grade clays are rare. The first recorded production was of bricks at Craigflower in 1853 and since then plants have operated in most towns and cities for short periods. Local surface clay is used at Haney to make common red brick, tile, and flower pots. Shale and fireclay from Abbotsford Mountain are used to make firebrick, facebrick, sewer pipe, flue lining, and special fireclay shapes in plants at Kilgard, Abbotsford, and South Vancouver. A plant at Quesnel makes pozzolan from burnt shale quarried south of Quesnel. Several hobby and art potteries and a sanitary-ware plant are in operation, but these use mainly imported raw materials and their production is not included in the tables. *See* Tables 3-1, 3-3, and 3-7E.

Coal--Coal is almost as closely associated with British Columbia's early history as is placer gold. Coal was discovered at Suquash on Vancouver Island in 1835 and at Nanaimo in 1850. The yearly value of coal production passed that of placer gold in 1883 and contributed a major part of the total mineral wealth for the next 30 years.

First production, by mining divisions: Cariboo, 1942; Fort Steele, 1898; Kamloops, 1893; Liard, 1923; Nanaimo, 1836; Nicola, 1907; Omineca, 1918; Osoyoos, 1926; Similkameen, 1909; and Skeena, 1912.

The Nanaimo and Comox fields produced virtually all of the coal until production started from the Crowsnest field in 1898. The Crowsnest field contains coking coal and prospered in the early years of smelting and railroad building. Mining started in the Nicola-Princeton Coalfield in 1907, at Telkwa in 1918, and on the Peace River in 1923. The Nanaimo field was exhausted in 1953 when the last large mines closed, and only small operations on remnants were left. The colliery at Merritt closed in 1945 and at Coalmont in 1940. The closing of the large mine at Tsable River in 1966, and the last small one, near Wellington in 1968, marked the end of continuous production from the important Vancouver Island deposits. Recent exploration indicates the possibility of renewed coal mining on the island and small amounts from Wolf Mountain commenced in 1984.

Undeveloped fields include basins in the foothills of the Rocky Mountains south of the Peace River, the Groundhog basin in north-central British Columbia, the Hat Creek basin west of Ashcroft, and Sage Creek basin southeast of Fernie.

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The enormous requirements for coking coal in Japan created intense exploration in various areas of British Columbia since 1968. The signing of large contracts with the Japanese resulted in preparations for production at several deposits in the East Kootenays. First shipments to Japan via special port facilities at North Vancouver and Roberts Bank began in 1970. Production from the Northeast Coalfields began in 1983 with shipments being made through the port of Prince Rupert.

All the coal produced, including that used in making coke, is shown as primary mine production. Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. From 1910 the quantity is the amount sold and used, which includes sales to retail and wholesale dealers, industrial users, and company employees; coal used under company boilers, including steam locomotives; and coal used in making coke. *See* Tables 3-1, 3-3, 3-7A, 3-8A, and 3-8B.

Cobalt--In 1928 a recovery of 1,730 pounds of cobalt was made from a shipment of arsenical gold ore from the Victoria mine on Rocher Deboule Mountain. From 1971 to 1973, cobalt was shipped from the Pride of Emory mine at Hope. *See* Tables 3-1 and 3-7C.

Coke--Coke is made from special types of coal. It has been produced in British Columbia since 1895. Being a manufactured product, its value does not contribute to the total mineral production as shown in Table 3-1. Up to 1966, coke statistics had been included in the Annual Report as Table 3-9, but this table has been discontinued. The coal used in making coke is still recorded in Table 3-8B.

Condensate--(a) *Field*--Field condensate consists of liquid hydrocarbons separated and recovered from natural gas in the field before gas processing. (b) *Plant*--Plant condensate is the hydrocarbon liquid extracted from natural gas at gas-processing plants. *See* Tables 3-1, 3-3, 3-7A, and 3-14.

Copper--From 1935 to 1978 no copper smelter operated in British Columbia and most of the copper concentrates were shipped to Japanese, eastern Canadian, and American smelters. From 1978 to 1983, Afton Mines Ltd. produced blister copper from its own concentrates. Most of the smelting in British Columbia in early years was done on ore shipped directly from the mines without concentration, but modern practice is to concentrate the ore first. Small amounts of gold and silver are commonly present and add value to the ore.

Ore was smelted in British Columbia first in 1896 at Nelson (from Silver King mine) and at Trail (from Rossland mines), and four and five years later at Grand Forks (from Phoenix mine) and Greenwood (from Mother Lode mine). Later, small smelters were built in the Boundary district and on Vancouver and Texada Islands, and in 1914 the Anyox smelter was blown in. Copper smelting ceased in the Boundary district in 1919, at Trail in 1929, and at Anyox in 1935. British Columbia copper concentrates were then smelted mainly at Tacoma, and since 1961 have gone chiefly to Japan.

Most of the production has come from southern British Columbia--from Britannia, Copper Mountain, Greenwood, Highland Valley, Merritt, Nelson, Rossland, Texada Island, and Vancouver Island, although a sizable amount came from Anyox and some from Tulsequah. During the 1960's, exploration for copper became intense, interest being especially directed toward finding very large, low-grade deposits suitable for open-pit mining. The activity has resulted in the establishment of operating mines at Merritt (Craigmont) in 1961, in Highland Valley (Bethlehem) in 1962, on Babine Lake (Granisle) in 1966, near Peachland (Brenda) in 1970, Stewart (Granduc)--closed mid-1978 but reopened in late 1980, near Port Hardy (Island Copper) in 1971, near Babine Lake (Bell), McLeese Lake (Gibraltar), Highland Valley (Lornex), Princeton (Ingerbelle) in 1972, and near Kamloops (Afton) in 1977. *See* Table 3-12 for a complete list of copper producers currently in production. The Highmont mine in the Highland Valley commenced shipments in 1981.

Some of these mines have produced molybdenum as a by-product, for example, Bethlehem, Brenda, Highmont, Lornex, Gibraltar, and Island Copper. Copper is also produced as a by-product of iron mining at Tasu Sound, Queen Charlotte Islands (Wesfrob), and with ores containing zinc, gold, silver, lead, and cadmium, at Buttle Lake (Lynx and Myra, Western Mines).

Copper has been the most valuable single commodity of the industry since 1966 except in 1977, 1979, 1981, 1982, and 1984 when it was surpassed by natural gas and coal. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Crude Oil--Production of crude oil in British Columbia began in 1955 from the Fort St. John field, but was not significant until late in 1961, when the oil pipeline was built to connect the oil-gathering terminal at Taylor to the Trans Mountain Oil Pipe Line Company pipeline near Kamloops.

In Tables 3-1, 3-3, and 3-7A, quantities given prior to 1962 under "petroleum, crude" are total sales, but since 1962 the field and plant condensates are listed separately. Table 3-14 incorporates all revisions since the commencement of production.

Diatomite--Relatively large deposits of diatomite are found near the Fraser River in the Quesnel area, and small deposits are widespread throughout the province. Small amounts of diatomite have been shipped from Quesnel periodically since 1928. A plant to process the material is located in Quesnel. *See* Table 3-7D.

Fluorite (Fluorspar)--Between 1918 and 1929, fluorite was mined at the Rock Candy mine north of Grand Forks for use in the Trail lead refinery. From 1958 to 1968, small quantities were produced as a by-product at the Oliver silica quarry. *See* Table 3-7D.

Flux--Silica and limestone are added to smelter furnaces as flux to combine with impurities in the ore and form a slag which separates from the valuable metal. In the past, silica was shipped from Grand Forks, Oliver, and the Sheep Creek area. Today, silica from near Kamloops and limestone, chiefly from Texada Island, are produced for flux. Quantities have been recorded since 1911. *See* Tables 3-1, 3-3, and 3-7.

Gold, Lode--Gold has played an important part in mining in the province. The first discovery of lode gold was on Morseby Island in 1852, when some gold was recovered from a small quartz vein. The first stamp mill was built in the Cariboo in 1876, and it seems certain that some arrastras (primitive grinding mills) were built even earlier. These and other early attempts were short-lived, and the successful milling of gold ores began about 1890 in the southern part of the province. By 1900 the value of gold production was second only to that of coal. At the start of World War II, gold mining attained a peak yearly value of more than $22 million, but since the war it has dwindled until developments in the 1970's.

In the early years, lode gold came mostly from the camps of Rossland, Nelson, McKinney, Fairview, Hedley, and also from the copper and other ores of the Boundary district. A somewhat later major producer was the Premier mine at Stewart. In the 1930's the price of gold increased and the value of production soared, new discoveries were made and old mines were revived. The principal gold camps, in order of output of gold, have been Bridge River, Rossland, Portland Canal, Hedley, Wells, and Sheep Creek. In 1971 the Bralorne mine at Bridge River closed.

Since the closing of the Bralorne mine, most of the lode gold is produced as a by-product of copper, copper-zinc-silver, and other base metal mining. Because of the volume of this production the amount of gold produced is still at a fairly high level, and with the significant rise in the price of gold in the 1970's the value of production has exceeded the peaks reached during the era of gold mines in the 1930's. With the new high prices for gold, interest has reawakened in vein and bulk gold properties with new producing mines like Carolin, Baker, Erickson and Morris Summit (Scottie Gold). *See* Tables 3-1, 3-3, 3-6, and 3-7B. *See* Table 3-12 for a complete list of current producers.

Gold, Placer--The early explorations and settlement of the province followed rapidly on the discovery of gold-bearing placer creeks throughout the country. The first placer-miners came in 1858 to mine the lower Fraser River bars upstream from Yale.

The year of greatest placer-gold production was 1863, shortly after the discovery of placer gold in the Cariboo. Another peak year in 1875 marked the discovery of placer on creeks in the Cassiar. A minor peak year was occasioned by the discovery of placer gold in the Granite Creek area in the Tulameen in 1885. A high level of production ensued after 1899, when the Atlin placers reached their peak output. Other important placer-gold camps were established at Goldstream, Fort Steele, Rock Creek, Omineca River, and Quesnel River. The last important strike was made on Cedar Creek in 1921; coarse gold was found on Squaw Creek in 1927, and on Wheaton Creek in 1932.

Mining in the old placer camps revived during the 1930's under the stimulus of an increase in the price of fine gold from $20.67 per ounce to $35 per ounce in United States funds. Since World War II, placer mining declined under conditions of steadily rising costs and a fixed price for gold but is showing signs of revival in response to a freely floating gold price since 1972. Since 1858, more than 163 966 618 grams valued at $111.9 million has been recovered.

A substantial part of the production, including much of the gold recovered from the Fraser River upstream from Yale (in the present New Westminster, Kamloops, and Lillooet Mining Divisions) and much of the early Cariboo production, was mined before the original organization of the Department of Mines in 1874. Consequently, the amounts recorded are based on early estimates and cannot be accurately assigned to individual mining divisions.

The first year of production for major placer-producing mining divisions was: Atlin, 1898; Cariboo, 1859; Liard, 1873; Lillooet, 1858; Omineca, 1869.

In 1965, changes were made in the allocation of placer gold in New Westminster and Similkameen Mining Divisions and "not assigned," to reconcile those figures with data incorporated in Bulletin 28, *Placer Gold Production of British Columbia*. *See* Tables 3-1, 3-3, 3-6, and 3-7A.

Granules--Rock chips used for bird grits, exposed aggregate, roofing, stucco, dash, terrazzo, etc., have been produced since 1930. *See* Tables 3-1, 3-3, and 3-7D.

Gypsum and Gypsite--Production of gypsum and gypsite has been recorded since 1911. Between 1925 and 1956, more than 907 000 tonnes were shipped from Falkland and some was quarried near Cranbrook and Windermere. Since 1956, nearly all production has come from Windermere. *See* Tables 3-1, 3-3, and 3-7D.

Hydromagnesite--Small shipments of hydromagnesite were made from Atlin between 1904 and 1916 and from Clinton in 1921. *See* Tables 3-1 and 3-7D.

Indium--Production of indium as a by-product of zinc refining at the Trail smelter began in 1942. Production figures have not been disclosed since 1958.

Iron--Iron ore was produced in small quantities as early as 1885, commonly under special circumstances or as test shipments. Steady production started in 1951 with shipments of magnetite concentrates to Japan from Vancouver and Texada Islands. Most of the known iron-ore deposits are magnetite, and occur in the coastal area. On average they are low in grade and need to be concentrated. Producing mines have operated on Texada Island, at Benson Lake and Zeballos on Vancouver Island, and at Tasu and Jedway on Morseby Island. At Texada Island copper was a by-product of iron mining, and in the Coast Copper mine at Benson Lake, iron was a by-product of copper mining. The latest operation, and to date the largest, was the Tasu mine, operating from the end of 1967 to 1983. Copper was produced also as a by-product from this mine.

From January 1961 to August 1972, calcined iron sulphide from the tailings of the Sullivan mine was used for making pig iron at Kimberley. This was the first manufacture of pig iron in British Columbia. The iron occurs as pyrrhotite and pyrite in the lead-zinc ore of the Sullivan mine. In the process of milling, the lead and zinc minerals are separated for shipment to the Trail smelter, and the iron sulphides are separated from the waste rock. Over the years a stockpile has been built containing a reserve of about 18 million tonnes of iron ore. The sulphur was removed in making pig iron and was converted to sulphuric acid, which was used in making fertilizer. A plant built at Kimberley converted the pig iron to steel, and a fabricating plant was acquired in Vancouver. The iron smelter at Kimberley closed in August 1972. The entire production, credited to the Fort Steele Mining Division in Table 3-7C, is of calcine. *See* Tables 3-1, 3-3, 3-6, and 3-7C.

Iron Oxide--Iron oxide, ochre, and bog iron were mined as early as 1918 from several occurrences, but mainly from limonite deposits north of Squamish. None has been produced since 1950. *See* Tables 3-1 and 3-7D.

Jade (Nephrite)--Production of jade (nephrite) has been recorded only since 1959 despite there being several years of significant production prior to that date. The jade is recovered from bedrock occurrences on Mount Ogden and near Dease Lake and as alluvial boulders from the Fraser River; the Bridge River and its tributaries, Marshall, Hell, and Cadwallader Creeks; O'Ne-ell, Ogden, Kwanika, and Wheaton Creeks. *See* Tables 3-1, 3-3, and 3-7D.

Lead--Lead was the most valuable single commodity for many years.

Lead and zinc usually occur together in nature although not necessarily in equal amounts in a single deposit. Zinc is the more abundant metal, but lead ore usually is more valuable than zinc ore because it contains more silver as a by-product. For a long time British Columbia produced almost all of Canada's lead, but now produces about 29 per cent of the total. Most of the concentrated ore is smelted and the metal refined at Trail.

Almost all of British Columbia's lead comes from the southeastern part of the province. The Sullivan mine at Kimberley is now producing about 90 per cent of the province's lead and has produced about 86 per cent of the grand total. This is one of the largest mines in the world and supports the great metallurgical works at Trail. Other mines are at Pend-d'Oreille River, North Kootenay Lake, Slocan, southwestern British Columbia, and Vancouver Island. In northwestern British Columbia less important parts of the total output have come from Tulsequah, the Premier mine, and several small mines in the general region of Hazelton. *See* Table 3-12 for current lead producers.

A small amount of high-grade lead ore is shipped directly to the smelter, but most of the ore is concentrated by flotation and the zinc content is separated from the lead. Generally all output from the Sullivan goes to the Trail smelter. Lead was first produced in 1887, and the total production amounts to approximately 8.4 million tonnes.

In 1958, revisions were made in some yearly totals for lead to adjust them for recovery of lead from slag treated at the Trail smelter. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

Limestone--Besides being used for flux and granules (where it is recorded separately), limestone is used in agriculture, in cement manufacture, in the pulp and paper industry, and for making lime. It has been produced since 1886. *See* Tables 3-1, 3-3, and 3-7E.

Magnesium—In 1941 and 1942, Cominco Ltd. produced magnesium from magnesite mined from a large deposit at Marysville. *See* Tables 3-1 and 3-7C.

Magnesium Sulphate—Magnesium sulphate was recovered in minor amounts at various times between 1915 and 1942 from small alkali lakes near Basque, Clinton, and Osoyoos. *See* Tables 3-1 and 3-7D.

Manganese—From 1918 to 1920, manganese ore was shipped from a bog deposit near Kaslo and from Hill 60 near Cowichan Lake, and in 1956 a test shipment was made from Olalla. *See* Tables 3-1 and 3-7C.

Mercury—Mercury was first produced near Savona in 1895. Since then small amounts have been recovered from the same area and from the Bridge River district. The main production to date was between 1940 and 1944 from the Pinchi Lake and Takla mines near Fort St. James. In 1968 the Pinchi Lake mine reopened and continued in operation until 1975 when it closed because of market situations. *See* Tables 3-1 and 3-7C.

Mica—No sheet mica has been produced commercially in British Columbia. Between 1932 and 1961, small amounts of mica schist for grinding were mined near Albreda, Armstrong, Oliver, Prince Rupert, and Sicamous. *See* Tables 3-1 and 3-7D.

Molybdenum—Molybdenum ore in small amounts was produced from high-grade deposits between 1914 and 1918. Recently, mining of large low-grade molybdenum and copper-molybdenum deposits has increased production to the point that molybdenum now ranks fourth in importance in annual value of metals produced in British Columbia. *See* Tables 3-1, 3-3, 3-6, and 3-7C.

Natro-alunite—In 1912 and 1913, 363 tonnes of natro-alunite was mined from a small low-grade deposit at Kyuquot Sound. There has been no subsequent production. *See* Tables 3-1 and 3-7D.

Natural Gas—Commercial production of natural gas began in 1954 to supply the community of Fort St. John. In 1957 the gas plant at Taylor and the pipeline to serve British Columbia and the northwestern United States was completed.

The production shown in Tables 3-1, 3-3, 3-7A, and 3-14, is the total amount sold of residential gas from processing plants plus dry and associated gas from the gas-gathering system; that is, the quantity delivered to the main transmission-line. The quantity is net after deducting gas used on leases, metering difference, and gas used or lost in the cleaning plant. The quantity is reported as millions of cubic metres at standard condition [99.2 kPa (kilopascals) pressure, 15°C temperature, up to and including the year 1960, and thereafter 101.3 kPa pressure, 15°C temperature]. Full details of gross well output, other production, delivery, and sales are given in the tables in the *Summary of Operations, Petroleum Resources Division*.

Nickel--One mine, the Pride of Emory near Hope, shipped nickel ore in 1936 and 1937 and began continuous production in 1958. From 1960 to 1974, bulk copper and nickel concentrates have been shipped to Japan and Alberta respectively for smelting. The mine closed in August 1974. *See Tables 3-1, 3-3, and 3-7C.*

Niobium--Niobium was produced from placer deposits on Vowell and Malloy Creeks in the Bugaboo area in 1956. A test shipment of 8 187 tonnes of gravel was shipped by St. Eugene Mining Corporation Limited to Quebec Metallurgical Industries. The placer contained a variety of minerals, including pyrochlore and uraninite. Recovery from the test shipment was as follows: 104.39 kilograms of niobium and 146.29 kilograms of uranium and thorium.

Palladium--Palladium was recovered in 1928, 1929, and 1930 as a by-product of the Trail refinery and is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. *See* Tables 3-1 and 3-7C.

Perlite--In 1953 a test shipment of 1 009 tonnes was made from a quarry on Francois Lake. Small shipments were made in 1983 and 1984. *See* Tables 3-1 and 3-7D.

Petroleum, Crude--See Crude oil.

Phosphate Rock--Between 1927 and 1933, Cominco Ltd. produced 3 485 tonnes of phosphate rock for test purposes, but the grade proved to be too low for commercial use. More test shipments were made in 1964, but there has been no commercial production. *See* Tables 3-1 and 3-7D.

Platinum--Platinum has been produced intermittently from placer streams in small amounts since 1887, mostly from the Tulameen and Similkameen Rivers. Placer platinum also has been recovered from Pine, Thibert, McConnell, Rainbow, Tranquille, Rock, and Government Creeks; from Quesnel, Fraser, Cottonwood, Peace, and Coquihalla Rivers; and from beach placers on Graham Island. Some platinum recovered between 1928 and 1930 as a by-product at the Trail refinery is presumed to have originated in copper concentrates shipped to the smelter from the Copper Mountain mine. Small amounts were contained in the placer gold in 1979. *See* Tables 3-1, 3-3, and 3-7C.

Propane--Propane is recovered from gas-processing plants at Taylor and Boundary Lake, and at oil refineries. *See* Tables 3-1, 3-3, and 3-7A

Rhenium--Rhenium occurs in significant quantities only with molybdenite associated with porphyry copper deposits. It was first produced in 1972 by the Island Copper mine and is extracted as rhenium oxide from fumes produced during roasting of the molybdenite concentrate.

Rock--Production of rubble, riprap, and crushed rock has been recorded since 1909. *See* Tables 3-1, 3-3, and 3-7E.

Sand and gravel--Sand and gravel is used as aggregate in concrete work. The output varies from year to year according to the level of activity in the construction industry. *See* Tables 3-1, 3-3, and 3-7E.

Selenium--The only recorded production of selenium, 332 kilograms, was in 1931 from the refining of blister copper from the Anyox smelter. *See* Tables 3-1 and 3-7C.

Silver--Silver is recovered from silver ores or as a by-product of other ores. Most of it is refined in Trail, and some is exported in concentrated ores of copper, lead, and zinc to American and Japanese smelters. Silver bullion was produced by the Torbrit mine from 1949 to 1959.

Some silver is associated with galena, while other is recovered from gold and copper ores, and although the silver in such ores is usually no more than a fraction of an ounce per ton, even that amount is important in a large tonnage operation.

Production of silver began in 1887 from silver-copper and silver-lead ores in the Kootenays and has continued in this area to the present. A considerable amount of the silver is a by-product of lead-zinc ores and nearly all is refined at Trail, although some is exported with concentrates to foreign smelters. By 1983 the Sullivan mine has accounted for 44.4 per cent of the total silver production of the province. In 1983 Equity Silver produced 46.6 per cent of the total silver produced in that year.

Significant amounts are contributed by the Lynx, Lornex, Island Copper, Afton, Silmonac, and Valley mines. Table 3-12 details current silver production. A former important mine, the Premier near Stewart, produced more than 1.3 million kilograms of silver between 1918 and 1968. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

In 1984, silver totals include 20 134 grams, valued at $7 855, recovered and paid for in placer gold.

Sodium antimonate--In 1983 and 1984, Equity Silver was the sole producer of sodium antimonate.

Sodium carbonate--Sodium carbonate was recovered between 1921 and 1949 from alkali lakes in the Clinton area and around Kamloops. There has been no further production. *See* Tables 3-1 and 3-7D.

Sodium sulphate--In 1983 and 1984, Equity Silver was the sole producer of sodium sulphate.

Stone (see Building-stone)--Cut stone for building purposes is prepared from rock produced at quarries in various parts of the province when required. Two of the most productive quarries have operated on Haddington and Nelson Islands. *See* Tables 3-1, 3-3, and 3-7E.

Structural materials--In Table 3-7E the value of $5 972 171 for unclassified materials is the total for structural materials in the period 1886-1919 that cannot be allotted to particular classes of structural materials or assigned to mining divisions, and includes $726 323 shown against 1896 in Table 3-2 that includes unclassified structural materials in that and previous years not assignable to particular years. The figure $3 180 828 in Table 3-7E under "Other Clay Products" is the value in the period 1886-1910 that cannot be allotted to particular clay products or assigned to mining divisions. *See* Tables 3-1, 3-2, 3-3, 3-7A, and 3-7E.

Sulphur--Production of sulphur has been recorded since 1916. From 1916 to 1927 the amounts include the sulphur content of pyrite shipped. From 1928 the amounts include the estimated sulphur content of pyrite shipped, plus the sulphur contained in sulphuric acid made from waste smelter gases. The sulphur content of pyrrhotite roasted at the Kimberley fertilizer plant is included since 1953. Elemental sulphur has been recovered from the Westcoast Transmission Co. Ltd. plant at Taylor since 1958 and the Fort Nelson plant of Petrosul International Ltd. since 1978. *See* Tables 3-1, 3-3, and 3-7D.

Talc--Between 1916 and 1936, talc was quarried at Leech River and at Anderson Lake to make dust for asphalt roofing. There has been no production since 1936. *See* Tables 3-1 and 3-7D.

Thorium--*See* niobium.

Tin--Tin, as cassiterite, is a by-product of the Sullivan mine, where it has been produced since 1941. Tin is also produced in a lead-tin alloy at the Trail smelter. *See* Tables 3-1, 3-3, and 3-7C.

Tungsten--Tungsten, very largely as scheelite concentrates, was produced from 1937 to 1958, first from the Columbia Tungsten's (Hardscrabble) mine in the Cariboo in 1937 and during World War II from the Red Rose mine near Hazelton and the Emerald mine near Salmo. The Red Rose closed in 1954 and the Emerald in 1958. Small amounts of scheelite have been produced from the Bridge River, Revelstoke, and other areas when demand was high. In 1970, production began from the Invincible mine near Salmo; it closed in 1973.

A very small amount of wolframite came from Boulder Creek near Atlin. *See* Tables 3-1, 3-3, and 3-7C.

Uranium--*See* niobium.

Volcanic ash--The only recorded production of volcanic ash is 27 tonnes from the Cariboo Mining Division in 1954. *See* Table 3-7D.

Zinc--Zinc was first produced in 1905. For many years lead was the most valuable single metal, but in 1950 the annual value of production of zinc surpassed that of lead and in 1966 the total value of copper production exceeded that of zinc. In 1977 the production of zinc was exceeded by that of copper, molybdenum, asbestos, coal, crude oil, and natural gas. Zinc is invariably associated with lead. Most ores are mined for their combined values in zinc, lead, and silver, and rarely for their zinc content alone. Some zinc ores contain a valuable amount of gold, and zinc is associated with copper at Lynx mine. Modern practice is to concentrate and separate the zinc mineral (sphalerite) from the lead mineral (galena). Most of the zinc concentrates go to the zinc-recovery plant at Trail, roasted, then converted electronically to refined metal. Usually some concentrates are shipped to American or Japanese smelters.

About 83.7 per cent of the zinc that has been mined in British Columbia has originated in southeastern British Columbia, at the Sullivan mine, and at mines near Ainsworth, Invermere, Moyie Lake, Riondel, Salmo, Slocan, and Spillimacheen. Other production has come from mines at

Portland Canal and Tulsequah and is coming from Buttle Lake and Callaghan Creek. The greatest zinc mine is the Sullivan, which has contributed about 71.7 per cent of the total zinc production of the province. *See* Table 3-12 for details of current zinc producers.

Records for the period 1905 to 1908 show shipments totalling 17 096 tonnes of zinc ore and zinc concentrates of unstated zinc content. In 1918, revisions were made to some yearly totals for zinc to adjust them for recovery of zinc from slag treated at the Trail smelter. *See* Tables 3-1, 3-3, 3-6, and 3-7B.

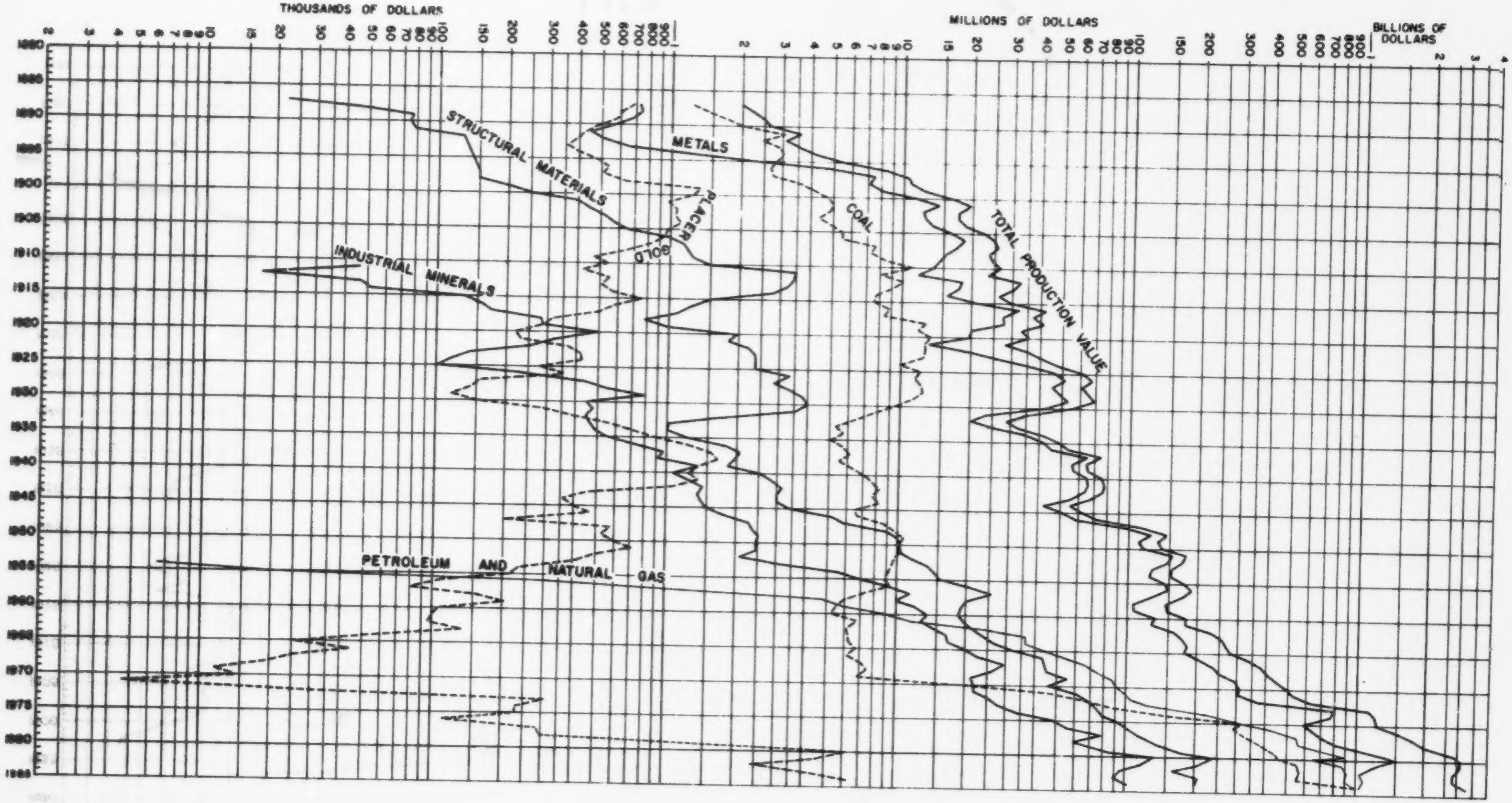

Figure 3-1. Value of Mineral Production, 1887-1984.

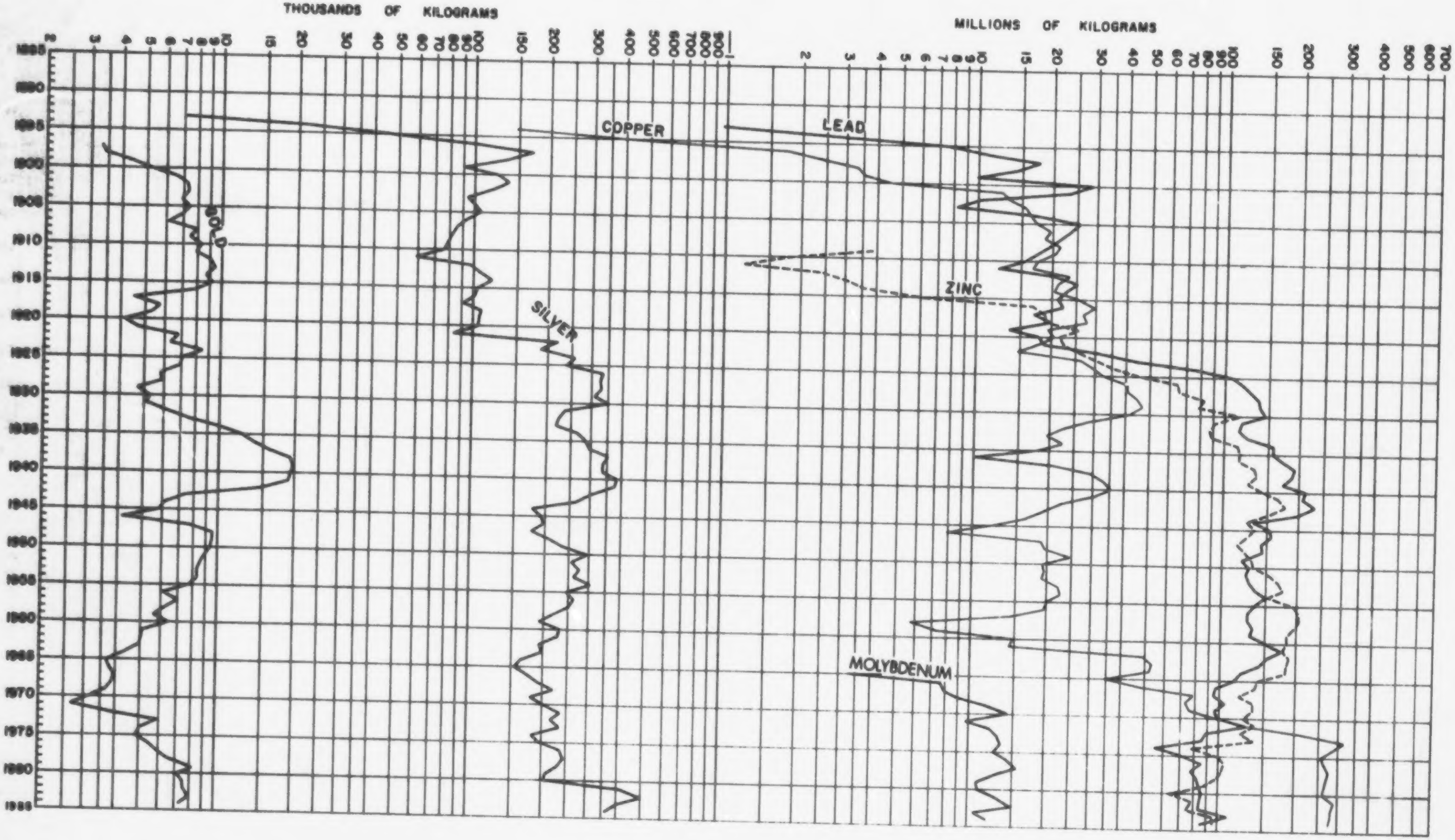

Figure 3-2. Production Quantities of Gold, Silver, Copper, Lead, Zinc, and Molybdenum, 1893-1984.

Prices[1] Used in Valuing Production of Gold, Silver, Copper, Lead, Zinc, and Coal

Year	Gold, Fine	Silver, Fine	Copper	Lead	Zinc	Coal
	$/g	$/g	$/kg	$/kg	$/kg	$/t
1901	0.66457	0.01801 N.Y.	0.355 N.Y.	0.057 N.Y.		
1902	..	.01593 ..	.258 ..	.081 ..	....	2.92
1903	..	.01633 ..	.292 ..	.084 ..	....	2.90
1904	..	.01716 ..	.283 ..	.086 ..	....	2.94
1905	..	.01650 ..	.344 ..	.094 ..	....	2.89
1906	..	.02040 ..	.425 ..	.106 ..	....	2.98
1907	..	.01995 ..	.441 ..	.106 ..	....	2.88
1908	..	.01615 ..	.291 ..	.083 ..	....	3.38
1909	..	.01573 ..	.286 ..	.085 ..	....	3.43
1910	..	.01634 ..	.281 ..	.088 ..	....	3.52
1911	..	.01628 ..	.273 ..	.088 ..	0.101 E. St. L.	3.69
1912	..	.01858 ..	.360 ..	.089 ..	.108 ..	3.51
1913	..	.01826 ..	.337 ..	.087 ..	.130 ..	3.70
1914	..	.01675 ..	.300 ..	.077 ..	.106 ..	3.74
1915	..	01518 ..	.381 ..	.092 ..	.097 ..	3.69
1916	..	.02006 ..	.600 ..	.136 ..	.248 ..	3.78
1917	..	.02487 ..	.599 ..	.174 ..	.240 ..	3.80
1918	..	.02956 ..	.543 ..	.147 ..	.167 ..	3.84
1919	..	.03394 ..	.412 ..	.114 ..	.153 ..	5.50
1920	..	.03080 ..	.385 ..	.158 ..	.138 ..	5.42
1921	..	.01914 ..	.276 ..	.090 ..	.144 ..	5.20
1922	..	.02062 ..	.295 ..	.114 ..	.087 ..	5.30
1923	..	.01981 ..	.318 ..	.144 ..	.107 ..	5.20
1924	..	.02040 ..	.287 ..	.161 ..	.124 ..	5.30
1925	..	.02221 ..	.310 ..	.173 Lond.	.119 ..	5.39
1926	..	.01997 ..	.304 ..	.149 ..	.174 Lond.	5.28
1927	..	.01812 ..	.285 ..	.116 ..	.163 ..	5.34
1928	..	.01870 ..	.321 ..	.101 ..	.137 ..	5.30
1929	..	.01704 ..	.399 ..	.111 ..	.121 ..	5.19
1930	..	.01227 ..	.286 ..	.087 ..	.119 ..	5.22
1931	..	.00923 ..	.179 ..	.060 ..	.079 ..	5.21
1932	.75459	.01018 ..	.141 Lond.	.047 ..	.056 ..	4.80
1933	.91953	.01216 ..	.164 ..	.053 ..	.053 ..	4.45
1934	1.10922	.01526 ..	.164 ..	.054 ..	.071 ..	4.30
1935	1.13140	.02083 ..	.172 ..	.069 ..	.067 ..	4.41
1936	1.12626	.01451 ..	.209 ..	.086 ..	.068 ..	4.35
1937	1.12497	.01443 ..	.288 ..	.113 ..	.073 ..	4.66
1938	1.13108	.01398 ..	.220 ..	.074 ..	.108 ..	4.68
1939	1.16195	.01302 ..	.223 ..	.070 ..	.068 ..	4.42
1940	1.23782	.01230 ..	.222 ..	.074 ..	.068 ..	4.43
1941	1.23782	.01230 ..	.222 ..	.074 ..	.075 ..	4.70
1942	1.23782	.01324 ..	.222 ..	.074 ..	.075 ..	4.57
1943	1.23782	.01455 ..	.259 ..	.083 ..	.075 ..	4.55
1944	1.23782	.01383 ..	.265 ..	.099 ..	.088 ..	4.60
1945	1.23782	.01511 ..	.277 ..	.110 ..	.095 ..	4.68
1946	1.18156	.02689 ..	.282 ..	.149 ..	.142 ..	4.67
1947	1.12529	.02315 ..	.450 ..	.301 ..	.172 ..	5.16
1948	1.12529	.02411 Mont.	.493 U.S.	.398 ..	.248 ..	5.64
1949	1.15744	.02387 U.S.	.440 ..	.348 U.S.	.307 ..	6.71
1950	1.22335	.02593 ..	.517 ..	.319 ..	.292 U.S.	7.18
1951	1.18477	.03040 ..	.611 ..	.406 ..	.332 ..	7.09
1952	1.10182	.02674 ..	.685 ..	.355 ..	.439 ..	7.12
1953	1.10665	.02693 ..	.669 ..	.292 ..	.350 ..	7.65
1954	1.09539	.02668 ..	.642 ..	.302 ..	.235 ..	7.58
1955	1.10986	.02825 ..	.844 ..	.329 ..	.230 ..	7.72
1956	1.10729	.02873 ..	.877 ..	.347 ..	.267 ..	7.43
1957	1.07867	.02799 ..	.574 ..	.310 ..	.293 ..	7.26
1958	1.09250	.02779 ..	.516 ..	.259 ..	.246 ..	7.45
1959	1.07932	.02812 ..	.611 ..	.257 ..	.221 ..	8.21
1960	1.09153	.02850 ..	.639 ..	.256 ..	.242 ..	8.74
1961	1.14008	.03012 ..	.620 ..	.243 ..	.277 ..	7.32
1962	1.20278	.03730 ..	.672 ..	.227 ..	.258 ..	8.16
1963	1.21371	.04436 ..	.676 ..	.265 ..	.274 ..	8.19
1964	1.21371	.04484 ..	.737 ..	.323 ..	.290 ..	8.08
1965	1.21307	.04481 ..	.846 ..	.380 ..	.323 ..	7.65
1966	1.21242	.04479 ..	1.176 ..	.359 ..	.345 ..	7.75
1967	1.21403	.05373 ..	1.125 ..	.333 ..	.344 ..	8.02
1968	1.21242	.07429 ..	1.195 ..	.321 ..	.329 ..	8.54
1969	1.21178	.06196 ..	1.470 ..	.354 ..	.312 ..	8.72

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[1] *See* page 60 for detailed explanation.

Prices[1] Used in Valuing Production of Gold, Silver, Copper, Lead, Zinc, and Coal—Continued

Year	Gold, Fine	Silver, Fine	Copper	Lead	Zinc	Coal
	$/g	$/g	$/kg	$/kg	$/kg	$/t
1970	1.17545	.05946 U.S.	1.294[2]	.360 U.S.	.353 U.S.	8.16
1971	1.13622	.05014 ″	1.030[2]	.308 ″	.359 ″	11.06
1972	1.84934	.05348 ″	.989[2]	.328 ″	.388 ″	12.08
1973	3.13185	.08251 ″	1.835[2]	.359 ″	.455 ″	12.71
1974	5.34868[2]	.15653[2]	1.884[2]	.422[2]	.767[2]	19.93
1975	5.20466[2]	.15560[2]	1.283[2]	.346[2]	.808[2]	35.53
1976	4.03514[2]	.13571[2]	1.438[2]	.384[2]	.615[2]	39.63
1977	5.29972[2]	.15707[2]	1.398[2]	.541[2]	.591[2]	39.04
1978	7.32948[2]	.19832[2]	1.577[2]	.637[2]	.544[2]	40.35
1979	12.58090[2]	.44228[2]	2.412[2]	1.043[2]	.700[2]	41.56
1980	22.77657[2]	.76814[2]	2.534[2]	.862[2]	.732[2]	42.64
1981	17.61233[2]	.37751[2]	2.10723[2]	.725[2]	.846[2]	47.16
1982	15.41585[2]	.31680[2]	1.769[2]	.514[2]	.846[2]	53.25
1983	16.44946[2]	.44832[2]	1.984[2]	.432[2]	.836[2]	48.41
1984	**16.39832**	**.33399**	**1.849**	**.445**	**1.289**	**48.58**

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[1] *See* page 60 for detailed explanation.

[2] *See* page 61 for explanation.

CONVERSION TABLE

Metric	Symbol
Tonnes	t ÷ .90718 = short tons.
Kilograms	kg ÷ .45359 = pounds.
Grams	g ÷ 31.103 = troy ounces.
Cubic metres	m^3 × 6.29 = barrels.
Thousand cubic metres	10^3m^3 × 35.49373 = thousand standard cubic feet.

Table 3-1—Mineral Production: Total to Date, Past Year, and Latest Year

Products[1]	Total Quantity to Date	Total Value to Date	Quantity, 1983	Value, 1983	Quantity, 1984	Value, 1984
Metals		$		$		$
Antimony.....kg	28 295 264	33 634 259	263 724	1 432 021	354 375	2 023 472
Bismuth.....kg	3 450 140	16 823 482	47 427	215 319	9 547	112 857
Cadmium.....kg	21 316 250	90 602 321	138 171	423 843	114 420	552 726
Chromite.....t	722	32 295	.....	.....	.....	.....
Cobalt.....kg	114 484	376 661	.....	.....	.....	.....
Copper.....kg	5 617 183 288	7 616 259 633	282 864 697	561 111 733	280 070 497	517 765 234
Gold—						
placer.....g	164 860 872	125 059 118	287 783	4 317 204	430 864	6 405 983
lode, fine.....g	614 220 693	1 435 849 407	7 693 571	126 555 114	6 813 576	111 731 223
Iron concentrates.....t	36 497 593	423 452 316	496 823	13 078 465	198 464	6 584 179
Lead.....kg	8 363 784 353	1 962 002 231	112 941 984	48 778 436	85 147 484	37 899 396
Magnesium.....kg	92 819	88 184	.....	.....	.....	.....
Manganese.....t	1 564	32 668	.....	.....	.....	.....
Mercury.....kg	6 094 387	49 218 263	.....	.....	.....	.....
Molybdenum.....kg	232 149 803	2 037 124 822	10 178 825	87 584 823	12 164 806	113 803 442
Nickel.....kg	23 337 783	51 698 754	.....	.....	.....	.....
Palladium.....g	23 296	30 462	.....	.....	.....	.....
Platinum.....g	44 042	138 801	.....	.....	.....	.....
Selenium.....kg	332	1 389	.....	.....	.....	.....
Silver.....g	18 957 629 572	1 434 406 477	402 325 338	180 372 129	363 378 002	121 364 145
Tin.....kg	10 409 606	40 183 935	136 347	1 985 213	208 554	2 830 486
Tungsten (WO_3).....kg	9 194 732	49 182 366	.....	.....	.....	.....
Zinc.....kg	7 923 116 429	2 305 084 874	95 286 818	79 634 214	95 334 645	115 225 652
Others.....	.....	43 097 219	.....	527 348	.....	601 998
Totals.....	.....	17 714 379 937	.....	1 106 015 862	.....	1 036 900 793
Industrial Minerals						
Arsenious oxide.....kg	9 987 789	273 201	.....	.....	.....	.....
Asbestos.....t	2 044 263	871 680 228	81 653	53 395 853	92 123	75 295 765
Bentonite.....t	718	16 858	.....	.....	.....	.....
Diatomite.....t	39 944	1 678 557	1 955	158 260	4 100	327 500
Fluorspar.....t	47 180	795 950	.....	.....	.....	.....
Fluxes.....t	4 154 083	11 381 935	54 076	1 166 314	16 652	58 759
Granules.....t	773 498	21 847 994	51 919	1 056 863	13 293	520 579
Gypsum and gypsite.....t	10 961 218	60 060 618	459 815	4 917 144	411 829	4 075 967
Hydromagnesite.....t	2 044	27 536	.....	.....	.....	.....
Iron oxide and ochre.....t	16 427	155 050	.....	.....	.....	.....
Jade.....kg	2 946 040	10 463 697	96 268	577 172	123 969	1 040 713
Magnesite.....t	141 207	2 761 968	51 960	999 191	86 443	1 762 777
Magnesium sulphate.....t	12 603	254 352	.....	.....	.....	.....
Mica.....kg	5 815 954	185 818	.....	.....	.....	.....
Natro-alunite.....t	473	9 398	.....	.....	.....	.....
Perlite.....t	2 009	16 120	1 000	.....[3]	1 000	5 000
Phosphate rock.....t	3 485	16 894	.....	.....	.....	.....
Pumice.....t	2 041	51 824	602	18 060	1 300	30 317
Sodium antimonate.....t	3 930	2 003 603	1 031	523 331	2 829	1 434 524
Sodium carbonate.....t	9 518	118 983	.....	.....	.....	.....
Sodium sulphate.....t	5 932	493 953	3 593	299 722	2 295	190 563
Sulphur.....t	11 359 508	272 658 096	483 733	24 862 954	508 917	27 215 071
Talc.....t	1 638	34 871	.....	.....	.....	.....
Volcanic ash.....t	27	300	.....	.....	.....	.....
Others.....	.....	23 404 837	.....	1 521 570	.....	2 711 986
Totals.....	.....	1 280 392 641	.....	89 496 434	.....	114 669 521
Structural Materials						
Cement.....t	25 263 975	945 442 186	853 064	71 080 982	939 354	69 939 148
Clay products.....	.....	178 767 690	.....	7 335 946	.....	7 230 396
Lime and limestone.....t	.....	153 854 340	2 711 559	12 126 785	2 772 103	12 785 416
Rubble, rip-rap, crushed rock.....t	.....	203 225 974	3 371 759	17 910 535	4 068 127	24 969 600
Sand and gravel.....t	.....	1 098 856 633	39 560 774	99 919 233	34 628 047	85 156 975
Building stone.....t	.....	9 460 829	181	28 047	170	15 760
Not assigned.....	.....	5 972 171	.....	.....	.....	.....
Totals.....	.....	2 595 579 823	.....	208 401 528	.....	200 097 295
Coal						
Coal—sold and used.....t	266 275 345	5 902 454 393	11 480 298	555 789 196	20 739 725	1 007 519 670
Totals—Solid Minerals..	.....	27 492 806 794	.....	1 959 703 020	.....	2 359 187 279
Petroleum and Natural Gas						
Crude oil.....m^3	60 765 984	2 905 779 693	2 078 771	402 075 887	2 094 156	434 600 112
Field condensate.....m^3	368 466	26 326 956	17 636	3 411 155	14 102	2 926 650
Plant condensate.....m^3	3 927 468	144 515 043	113 984	20 225 321	131 441	2 926 650
Natural gas to pipeline..... 10^3m^3	175 923 067	5 195 000 656	6 899 911	455 187 128	7 769 368	518 683 014
Butane.....m^3	2 084 239	77 685 585	80 291	12 897 946	81 972	11 076 111
Propane.....m^3	1 638 821	45 656 156	62 494	5 553 842	59 687	5 440 470
Totals.....	.....	8 394 964 089	.....	899 351 279	.....	997 750 056
Grand Totals.....	.....	35 887 770 883	.....	2 859 054 299	.....	3 356 937 335

[1] *See* notes on individual products listed alphabetically on pages 63 to 77.

[2] *See* page 82 for conversion table to old system.

[3] Test shipment — no value.

Table 3-2—Total Value of Mineral Production, 1836–1984

Year	Metals	Industrial Minerals	Structural Materials	Coal	Petroleum and Natural Gas	Total
	$	$	$	$	$	$
1836–86	52 880 730	....	43 650	10 758 565	....	63 610 965
1887	729 381	....	22 168	1 240 080	....	1 991 629
1888	745 794	....	46 432	1 467 903	....	2 260 129
1889	685 512	....	77 517	1 739 490	....	2 502 519
1890	572 884	....	75 201	2 034 420	....	2 682 505
1891	447 136	....	79 475	3 087 291	....	3 613 902
1892	511 075	....	129 234	2 479 005	....	3 119 314
1893	659 969	....	....	2 934 882	....	3 594 851
1894	1 191 728	....	....	3 038 859	....	4 230 587
1895	2 834 629	....	....	2 824 687	....	5 659 316
1896	4 973 769	....	726 323	2 693 961	....	8 394 053
1897	7 575 262	....	150 000	2 734 522	....	10 459 784
1898	7 176 870	....	150 000	3 582 595	....	10 909 465
1899	8 107 509	....	200 000	4 126 830	....	12 434 312
1900	11 360 546	....	250 000	4 744 530	....	16 355 076
1901	14 258 455	....	400 000	5 016 398	....	19 674 853
1902	12 163 561	....	450 000	4 832 257	....	17 445 818
1903	12 640 083	....	525 000	4 332 297	....	17 497 380
1904	13 424 755	2 400	575 000	4 953 024	....	18 955 179
1905	16 289 165	....	660 800	5 511 861	....	22 461 826
1906	18 449 602	....	982 900	5 548 044	....	24 980 546
1907	17 101 305	....	1 149 400	7 637 713	....	25 888 418
1908	15 277 991	....	1 200 000	7 356 866	....	23 784 857
1909	14 668 141	....	1 270 559	8 574 884	....	24 513 584
1910	13 768 731	....	1 500 000	11 108 335	....	26 377 066
1911	11 880 062	46 345	3 500 917	8 071 747	....	23 499 071
1912	18 218 266	17 500	3 436 222	10 786 812	....	32 458 800
1913	17 701 432	46 446	3 249 605	9 107 460	....	30 194 943
1914	15 790 727	51 810	2 794 107	7 745 847	....	26 382 491
1915	20 765 212	133 114	1 509 235	7 114 178	....	29 521 739
1916	32 092 648	150 718	1 247 912	8 900 675	....	42 391 953
1917	27 299 934	174 107	1 097 900	8 484 343	....	37 056 284
1918	27 957 302	281 131	783 280	12 833 994	....	41 855 707
1919	20 058 217	289 426	980 790	11 975 671	....	33 304 104
1920	19 687 532	508 601	1 962 824	13 450 169	....	35 609 126
1921	13 160 417	330 503	1 808 392	12 836 013	....	28 135 325
1922	19 605 401	251 922	2 469 967	12 880 060	....	35 207 350
1923	25 769 215	140 409	2 742 388	12 678 548	....	41 330 560
1924	35 959 566	116 932	2 764 013	9 911 935	....	48 752 446
1925	46 480 742	101 319	2 766 838	12 168 905	....	61 517 804
1926	51 867 792	223 748	3 335 885	11 650 180	....	67 077 605
1927	45 134 289	437 729	2 879 160	12 269 135	....	60 720 313
1928	48 640 158	544 192	3 409 142	12 633 510	....	65 227 002
1929	52 805 345	807 502	3 820 732	11 256 260	....	68 689 839
1930	41 785 380	457 225	4 085 105	9 435 650	....	55 763 360
1931	23 530 469	480 319	3 538 519	7 684 155	....	35 233 462
1932	20 129 869	447 495	1 705 708	6 523 644	....	28 806 716
1933	25 777 723	460 683	1 025 586	5 375 171	....	32 639 163
1934	35 177 224	486 554	1 018 719	5 725 133	....	42 407 630
1935	42 006 618	543 583	1 238 718	5 048 864	....	48 837 783
1936	45 889 944	724 362	1 796 677	5 722 502	....	54 133 485
1937	65 224 245	976 171	2 098 339	6 139 920	....	74 438 675
1938	55 959 713	916 841	1 974 976	5 565 069	....	64 416 599
1939	56 216 049	1 381 720	1 832 464	6 280 956	....	65 711 189
1940	64 332 166	1 073 023	2 534 840	7 088 265	....	75 028 294
1941	68 807 630	1 253 561	2 845 262	7 660 000	....	77 566 453
1942	63 626 140	1 434 382	3 173 635	8 237 172	....	76 471 329
1943	55 005 394	1 378 337	3 025 255	7 742 030	....	67 151 016
1944	42 095 013	1 419 248	3 010 088	8 217 966	....	54 742 315
1945	50 673 592	1 497 720	3 401 229	6 454 360	....	62 026 901
1946	58 834 747	1 783 010	5 199 563	6 732 470	....	72 549 790
1947	95 729 867	2 275 972	5 896 803	8 680 440	....	112 583 082
1948	124 091 753	2 358 877	8 968 222	9 765 395	....	145 184 247
1949	110 219 917	2 500 799	9 955 790	10 549 924	....	133 226 430
1950	117 166 836	2 462 340	10 246 939	10 119 303	....	139 995 418

Table 3-2—Total Value of Mineral Production, 1836–1984—Continued

Year	Metals	Industrial Minerals	Structural Materials	Coal	Petroleum and Natural Gas	Total
	$	$	$	$	$	$
1951	153 598 411	2 493 840	10 606 048	10 169 617	....	176 867 916
1952	147 857 523	2 181 464	11 596 961	9 729 739	....	171 365 687
1953	126 755 705	3 002 673	13 555 038	9 528 279	....	152 841 695
1954	123 834 286	5 504 114	14 395 174	9 154 544	6 545	152 894 663
1955	142 609 505	6 939 490	15 299 254	8 986 501	18 610	173 853 360
1956	149 441 246	9 172 792	20 883 631	9 346 518	319 465	189 163 652
1957	125 353 920	11 474 050	25 626 939	7 340 339	1 197 581	170 992 829
1958	104 251 112	9 958 768	19 999 576	5 937 860	4 806 233	144 953 549
1959	105 076 530	12 110 286	19 025 209	5 472 064	5 967 128	147 651 217
1960	130 304 373	13 762 102	18 829 989	5 242 223	9 226 646	177 365 333
1961	128 565 774	12 948 308	19 878 921	6 802 134	11 612 184	179 807 321
1962	159 627 293	14 304 214	21 366 265	6 133 986	27 939 726	229 371 484
1963	172 852 866	16 510 898	23 882 190	6 237 997	36 379 636	255 863 587
1964	180 926 329	16 989 469	26 428 939	6 327 678	36 466 753	267 139 168
1965	177 101 733	20 409 649	32 325 714	6 713 590	44 101 662	280 652 348
1966	208 664 003	22 865 324	43 780 272	6 196 219	54 274 187	335 780 005
1967	235 865 318	29 364 065	44 011 488	7 045 341	67 096 286	383 382 498
1968	250 912 026	26 056 782	45 189 476	7 588 989	75 281 215	405 028 488
1969	294 881 114	20 492 943	55 441 528	6 817 155	86 756 009	464 388 749
1970	309 981 470	22 020 359	46 104 071	19 559 669	90 974 467	488 640 036
1971	301 059 951	21 909 767	59 940 333	45 801 936	99 251 158	527 963 145
1972	372 032 770	25 764 120	66 745 698	66 030 210	105 644 978	636 217 776
1973	795 617 596	27 969 664	73 720 831	87 976 105	124 104 445	1 109 388 641
1974	764 599 451	33 676 214	78 088 393	154 593 643	233 275 505	1 264 233 206
1975	586 650 344	48 667 602	90 928 011	317 111 744	320 719 474	1 364 077 175
1976	646 750 403	52 917 142	100 938 648	298 683 679	420 973 564	1 520 263 436
1977	714 036 707	79 185 099	115 650 992	328 846 883	550 439 856	1 788 159 537
1978	819 778 518	59 471 361	142 105 285	381 895 241	568 931 051	1 972 181 456
1979	1 350 776 761	83 100 984	187 671 941	439 280 152	896 377 125	2 957 206 963
1980	1 429 002 180	115 926 007	242 325 657	461 492 857	828 302 626	3 077 049 327
1981	1 246 682 535	122 464 842	200 786 279	554 271 292	884 516 084	3 008 721 032
1982	1 057 488 380	95 644 218	164 156 644	566 878 240	912 902 555	2 797 070 037
1983	1 106 015 862	89 496 434	208 401 528	555 789 196	899 351 279	2 859 054 299
1984	1 036 900 793	114 669 521	200 097 295	1 007 519 670	997 750 056	3 356 937 335
Totals	17 714 379 937	1 280 392 641	2 595 579 823	5 902 454 393	8 394 964 089	35 887 770 883

Table 3-3—Mineral Production for the 10 Years, 1975–1984

Description	1975 Quantity	1975 Value	1976 Quantity	1976 Value	1977 Quantity	1977 Value	1978 Quantity	1978 Value	1979 Quantity	1979 Value
Metals		$		$		$		$		$
Antimony ... kg	364 045	1 467 928	447 001	1 636 871	596 207	2 519 739	459 521	2 083 895	177 046	916 081
Bismuth ... kg	19 163	261 931	20 261	226 462	18 540	187 612	28 172	166 452	33 809	173 667
Cadmium ... kg	320 923	1 971 035	356 422	1 530 800	320 711	1 720 051	253 803	1 186 320	239 096	1 417 506
Copper ... kg	258 497 599	331 693 850	263 618 197	378 984 941	275 224 115	384 736 661	273 692 676	431 694 395	272 163 001	656 359 923
Gold—placer ... g	43 744	232 204	26 064	115 613	46 170	289 075	36 515	295 001	214 106	2 649 918
lode, fine ... g	4 819 241	25 082 494	5 393 477	21 761 502	5 906 336	31 301 931	6 542 332	47 951 880	8 062 810	101 481 156
Iron concentrates ... t	1 305 840	15 273 878	1 255 277	14 760 526	445 317	7 362 345	615 569	11 597 462	668 026	13 008 475
Lead ... kg	70 603 483	24 450 158	85 407 582	32 796 533	78 172 646	42 316 293	81 064 539	51 640 564	84 451 905	88 100 363
Molybdenum ... kg	13 026 627	71 201 391	14 088 686	94 109 138	15 521 970	142 057 947	13 055 203	167 714 272	10 766 497	321 228 104
Nickel ... kg	...	...	...	...	...	...	...	...	- 280	3 793
Silver ... g	196 305 885	30 545 947	239 720 882	32 532 836	241 503 007	37 934 098	227 271 890	45 071 509	214 117 518	94 700 656
Tin ... kg	32 511	200 669	102 262	712 912	187 478	1 912 300	261 863	3 675 508	240 984	3 818 948
Tungsten (WO$_3$) ... kg	...	...	...	...	...	...	...	...	...	...
Zinc ... kg	99 668 230	80 572 872	106 498 987	65 499 108	103 780 228	61 301 001	95 618 111	52 048 701	88 418 642	61 890 891
Others ...	...	3 695 987	...	2 083 161	...	397 654	...	4 652 559	...	5 027 280
Subtotals ...	...	586 650 344	...	646 750 403	...	714 036 707	...	819 778 518	...	1 350 776 761
Industrial Minerals										
Asbestos ... t	76 771	37 849 743	90 443	40 727 296	97 033	69 729 205	68 266	47 066 170	94 286	65 520 089
Diatomite ... t	5 847	229 483	2 737	182 159	1 239	49 595	2 184	59 346	1 452	33 025
Fluxes (quartz, limestone) ... t	35 914	174 824	11 378	33 263	28 624	95 461	22 475	56 894	27 741	129 036
Granules (quartz, limestone, granite) ... t	33 316	1 144 968	31 476	1 219 884	29 551	1 238 485	26 849	1 186 160	30 074	1 458 987
Gypsum and gypsite ... t	474 387	1 751 799	556 134	4 434 471	653 126	2 357 488	733 080	3 110 695	718 557	3 782 628
Jade ... kg	110 437	414 123	483 796	1 535 030	266 621	825 523	488 759	1 422 018	238 505	1 325 777
Sulphur ... t	246 079	5 738 134	231 704	4 296 189	248 892	3 871 660	322 181	5 647 993	383 724	9 616 390
Others ...	...	1 364 528	...	488 850	...	1 017 682	...	922 085	...	1 235 073
Subtotals ...	...	48 667 602	...	52 917 142	...	79 185 099	...	59 471 361	...	83 100 984
Structural Materials										
Cement ... t	915 293	31 681 722	846 548	34 973 746	909 522	42 705 320	1 020 065	56 140 564	1 550 596	89 185 273
Clay products ...	...	6 593 189	...	6 955 917	...	4 909 799	...	6 282 560	...	11 744 194
Lime and limestone ... t	1 976 415	4 349 800	2 173 831	5 610 063	2 231 166	5 861 614	2 512 867	6 929 484	2 880 138	8 037 476
Rubble, riprap, and crushed rock ... t	4 103 452	8 723 448	2 485 215	5 205 973	2 464 503	7 309 536	2 841 920	8 410 065	2 488 389	6 766 665
Sand and gravel ... t	28 945 523	39 575 457	36 073 618	48 138 635	53 994 528	54 809 121	38 353 326	64 324 582	46 241 983	71 918 633
Building-stone ... t	53	4 395	657	14 314	4 535	55 602	405	18 030	2 194	19 780
Subtotals ...	...	90 928 011	...	100 938 648	...	115 650 992	...	142 105 285	...	187 671 941
Coal										
Sold and used ... t	8 924 816	317 111 744	7 537 695	298 683 679	8 424 181	328 846 883	9 463 920	381 895 241	10 570 370	439 280 152
Total solid minerals .	...	1 043 357 701	...	1 099 289 872	...	1 237 719 681	...	1 403 250 405	...	2 060 829 838
Petroleum and Natural Gas										
Crude oil ... m^3	2 269 898	94 229 725	2 367 450	116 595 050	2 200 303	132 859 085	2 004 699	145 005 524	2 139 963	168 928 671
Field condensate ... m^3	16 094	668 092	18 309	901 711	24 465	1 477 248	25 386	1 836 217	32 549	2 569 418
Plant condensate ... m^3	185 272	6 525 837	167 576	7 198 957	180 267	9 751 058	155 503	10 269 861	184 398	13 396 500
Natural gas delivered to pipeline ... 10^3m^3	9 236 489	214 733 528	8 799 508	287 997 059	8 895 663	396 601 354	8 003 029	401 373 236	11 392 641	699 508 127
Butane ... m^3	106 427	2 577 205	109 781	4 591 832	111 357	5 358 167	106 580	5 932 766	112 683	7 122 711
Propane ... m^3	81 975	1 985 087	88 195	3 688 955	91 297	4 392 944	85 732	4 513 447	84 864	4 851 698
Total petroleum and natural gas ...	...	320 719 474	...	420 973 564	...	550 439 856	...	568 931 051	...	896 377 125
Grand totals ...	...	1 364 077 175	...	1 520 263 436	...	1 788 159 537	...	1 972 181 456	...	2 957 206 963

Table 3-3—Mineral Production for the 10 Years, 1975–1984—Continued

Description		1980		1981		1982		1983		1984	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals			$		$		$		$		$
Antimony	kg	78 654	416 080	68 323	360 745	213 519	1 161 543	263 724	1 432 021	354 375	2 023 472
Bismuth	kg	23 501	136 306	47 300	102 641	27 305	83 007	47 427	215 319	9 547	112 857
Cadmium	kg	92 360	560 679	101 962	371 077	147 656	286 265	138 171	423 843	114 420	552 726
Copper	kg	264 674 830	670 623 616	290 088 241	611 282 050	279 873 599	495 009 799	282 864 697	561 111 733	280 070 497	517 765 234
Gold—placer	g	280 104	6 213 376	291 705	4 540 289	175 607	2 467 470	287 783	4 317 204	430 864	6 405 983
lode, fine	g	7 197 312	163 930 073	7 468 769	131 542 422	7 511 908	115 802 480	7 693 571	126 555 114	6 813 576	111 731 223
Iron concentrates	t	653 324	13 670 233	602 272	14 274 498	774 951	19 630 010	496 823	13 078 465	198 464	6 584 179
Lead	kg	76 709 447	66 096 223	84 854 093	61 529 276	83 746 551	43 035 587	112 941 984	48 778 436	85 147 484	37 899 396
Molybdenum	kg	11 209 501	288 934 398	12 933 244	198 240 391	14 747 888	154 990 970	10 778 825	87 584 823	12 164 806	113 803 442
Platinum	g	………	………	………	………	………	………	………	………	………	………
Silver	g	293 801 811	156 548 306	403 754 797	152 420 716	499 565 577	158 260 320	402 325 338	180 372 129	363 378 002	121 364 145
Tin	kg	139 517	2 438 881	150 341	2 198 138	115 261	1 568 666	136 347	1 985 213	208 554	2 830 486
Tungsten (WO_3)	kg	………	………	………	………	104 730	1 114 350	………	………	………	………
Zinc	kg	67 481 328	49 363 417	79 214 552	67 026 535	75 182 699	63 571 545	95 286 818	79 634 214	95 334 645	115 225 652
Others		………	10 070 592	………	2 793 757	………	506 368	………	527 348	………	601 998
Subtotals		………	1 429 002 180	………	1 246 682 535	………	1 057 488 380	………	1 106 015 862	………	1 036 900 793
Industrial Minerals											
Asbestos	t	100 089	81 688 936	90 914	76 770 285	76 084	57 032 422	81 653	53 395 853	92 123	75 295 765
Diatomite	t	3 615	138 273	3 600	155 232	137	6 850	1 955	158 260	4 100	327 500
Fluxes (quartz, limestone)	t	43 986	93 135	48 313	509 678	53 801	1 018 576	54 076	1 166 314	16 652	58 759
Granules (quartz, limestone, granite)	t	31 393	1 694 947	28 297	1 756 810	20 962	1 400 812	51 919	1 056 863	13 293	520 579
Gypsum and gypsite	t	751 067	5 387 949	684 924	5 804 770	415 458	5 468 093	459 815	4 917 144	411 829	4 075 967
Jade	kg	449 156	1 580 241	59 208	133 598	78 681	320 861	96 268	577 172	123 969	1 040 713
Sulphur	t	359 413	21 712 359	507 566	33 337 562	423 892	29 115 860	483 733	24 862 954	508 917	27 215 071
Others		………	3 630 167	………	3 996 907	………	1 280 744	………	3 361 874	………	6 135 167
Subtotals		………	115 926 007	………	122 464 842	………	95 644 218	………	89 496 434	………	114 669 521
Structural Materials											
Cement	t	1 351 320	90 881 086	955 922	82 372 375	749 571	69 265 713	853 064	71 080 982	939 354	69 939 148
Clay products		………	10 387 121	………	10 292 772	………	5 853 261	………	7 335 946	………	7 230 396
Lime and limestone	t	3 129 762	9 945 044	2 659 406	9 400 205	2 575 441	10 465 577	2 711 559	12 126 785	2 772 103	12 785 416
Rubble, riprap, and crushed rock	t	7 019 167	32 436 456	3 168 694	11 100 383	2 652 976	12 898 647	3 371 759	17 910 535	4 068 127	24 969 600
Sand and gravel	t	45 278 202	98 666 100	42 361 930	87 603 864	26 702 329	65 648 899	39 560 774	99 919 233	34 628 047	85 156 975
Building-stone	t	91	9 850	383	11 875	145	24 547	181	28 047	170	15 760
Subtotals		………	242 325 657	………	200 786 479	………	164 156 644	………	208 401 528	………	200 097 295
Coal											
Sold and used	t	10 823 530	461 492 857	11 752 621	554 271 292	10 645 742	566 878 240	11 480 298	555 789 196	20 739 725	1 007 519 670
Total solid minerals		………	2 248 746 701	………	2 124 205 148	………	1 884 167 482	………	1 959 703 020	………	2 359 187 279
Petroleum and Natural Gas											
Crude oil	m^3	2 002 128	189 561 479	2 035 953	236 170 548	2 078 258	333 892 930	2 078 771	402 075 887	2 094 156	434 600 112
Field condensate	m^3	36 885	3 489 431	27 871	3 233 036	20 771	3 337 069	17 636	3 411 155	14 102	2 926 650
Plant condensate	m^3	133 601	11 641 991	124 946	13 284 259	135 185	19 765 399	113 984	20 225 321	131 441	25 023 699
Natural gas delivered to pipeline	10^3m^3	8 931 833	612 545 107	8 062 681	616 795 096	7 188 561	542 664 470	6 899 911	455 187 128	7 769 368	518 683 014
Butane	m^3	89 556	6 491 914	84 635	9 953 076	89 443	9 436 236	80 291	12 897 946	81 972	11 076 111
Propane	m^3	75 507	4 572 704	64 118	5 080 069	68 783	3 806 451	62 494	5 553 842	59 687	5 440 470
Total petroleum and natural gas		………	828 302 626	………	884 516 084	………	912 902 555	………	899 351 279	………	997 750 056
Grand totals		………	3 077 049 327	………	3 008 721 232	………	2 797 070 037	………	2 859 054 299	………	3 356 937 335

Table 3-3—Mineral Production for the 10 Years, 1975–1984

Description	1975		1976		1977		1978		1979	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony ... kg	364 045	1 467 928	447 001	1 636 871	596 207	2 519 739	459 521	2 083 895	177 046	916 081
Bismuth ... kg	19 163	261 931	20 261	226 462	18 540	187 612	28 172	166 452	33 809	173 667
Cadmium ... kg	320 923	1 971 035	356 422	1 530 800	320 711	1 720 051	253 803	1 186 320	239 096	1 417 506
Copper ... kg	258 497 599	331 693 850	263 618 197	378 984 941	275 224 115	384 736 661	273 692 676	431 694 395	272 163 001	656 359 923
Gold—placer ... g	43 744	232 204	26 064	115 613	46 170	289 075	36 515	295 001	214 106	2 649 918
lode, fine ... g	4 819 241	25 082 494	5 393 477	21 761 502	5 906 336	31 301 931	6 542 332	47 951 880	8 062 810	101 481 156
Iron concentrates ... t	1 305 840	15 273 878	1 255 277	14 760 526	445 317	7 362 345	615 569	11 597 462	668 026	13 008 475
Lead ... kg	70 603 483	24 450 158	85 407 582	32 796 533	78 172 646	42 316 293	81 064 539	51 640 564	84 451 905	88 100 363
Molybdenum ... kg	13 026 627	71 201 391	14 088 686	94 109 138	15 521 970	142 057 947	13 055 203	167 714 272	10 766 497	321 228 104
Nickel ... kg	......	......	......	......	......	......	......	......	280	3 793
Silver ... g	196 305 885	30 545 947	239 720 882	32 532 836	241 503 007	37 934 098	227 271 890	45 071 509	214 117 518	94 700 656
Tin ... kg	32 511	200 669	102 262	712 912	187 478	1 912 300	261 863	3 675 508	240 984	3 818 948
Tungsten (WO$_3$) ... kg	......	......	......	......	......	......	......	......	......	......
Zinc ... kg	99 668 230	80 572 872	106 498 987	65 499 108	103 780 228	61 301 001	95 618 111	52 048 701	88 418 642	61 890 891
Others ...	......	3 695 987	......	2 083 161	......	397 654	......	4 652 559	......	5 027 280
Subtotals ...	......	586 650 344	......	646 750 403	......	714 036 707	......	819 778 518	......	1 350 776 761
Industrial Minerals										
Asbestos ... t	76 771	37 849 743	90 443	40 727 296	97 033	69 729 205	68 266	47 066 170	94 286	65 520 089
Diatomite ... t	5 847	229 483	2 737	182 159	1 239	49 595	2 184	59 346	1 452	33 025
Fluxes (quartz, limestone) ... t	35 914	174 824	11 378	33 263	28 624	95 461	22 475	56 894	27 741	129 035
Granules (quartz, limestone, granite) ... t	33 316	1 144 968	31 476	1 219 884	29 551	1 238 485	26 849	1 186 160	30 074	1 458 987
Gypsum and gypsite ... t	474 387	1 751 799	556 134	4 434 471	653 126	2 357 488	733 080	3 110 695	718 557	3 782 628
Jade ... kg	110 437	414 123	483 796	1 535 030	266 621	825 523	488 759	1 422 018	258 505	1 325 777
Sulphur ... t	246 079	5 738 134	231 704	4 296 189	248 892	3 871 660	322 181	5 647 993	383 724	9 616 390
Others ...	......	1 364 528	......	488 850	......	1 017 682	......	922 085	......	1 235 073
Subtotals ...	......	48 667 602	......	52 917 142	......	79 185 099	......	59 471 361	......	83 100 984
Structural Materials										
Cement ... t	915 293	31 681 722	846 548	34 973 746	909 522	42 705 320	1 020 065	56 140 564	1 550 596	89 185 273
Clay products ...	......	6 593 189	......	6 955 917	......	4 909 799	......	6 282 560	......	11 744 194
Lime and limestone ... t	1 976 415	4 349 800	2 173 831	5 610 063	2 231 166	5 861 614	2 512 867	6 929 484	2 880 138	8 037 476
Rubble, riprap, and crushed rock ... t	4 103 452	8 723 448	2 485 215	5 205 973	2 464 503	7 309 536	2 841 920	8 410 065	2 488 389	6 766 665
Sand and gravel ... t	28 945 523	39 575 457	36 073 618	48 138 635	53 994 528	54 809 121	38 353 326	64 324 582	46 241 983	71 918 633
Building-stone ... t	53	4 395	657	14 314	4 535	55 602	405	18 030	2 194	19 700
Subtotals ...	......	90 928 011	......	100 938 648	......	115 650 992	......	142 105 285	......	187 671 941
Coal										
Sold and used ... t	8 924 816	317 111 744	7 537 695	298 683 679	8 424 181	328 846 883	9 463 920	381 895 241	10 570 370	439 280 152
Total solid minerals ...	......	1 043 357 701	......	1 099 289 872	......	1 237 719 681	......	1 403 250 405	......	2 060 829 838
Petroleum and Natural Gas										
Crude oil ... m^3	2 269 898	94 229 725	2 367 450	116 595 050	2 200 303	132 859 085	2 004 699	145 005 524	2 139 963	168 928 671
Field condensate ... m^3	16 094	668 092	18 309	901 711	24 465	1 477 248	25 386	1 836 217	32 549	2 569 418
Plant condensate ... m^3	185 272	6 525 837	167 576	7 198 957	180 267	9 751 058	155 503	10 269 861	184 398	13 396 500
Natural gas delivered to pipeline ... 10^{3}m^3	9 236 489	214 733 528	8 799 508	287 997 059	8 895 663	396 601 354	8 003 029	401 373 236	11 392 641	699 508 127
Butane ... m^3	106 427	2 577 205	109 781	4 591 832	111 357	5 358 167	106 580	5 932 766	112 683	7 122 711
Propane ... m^3	81 975	1 985 087	88 195	3 688 955	91 297	4 392 944	85 732	4 513 447	84 864	4 851 698
Total petroleum and natural gas ...	......	320 719 474	......	420 973 564	......	550 439 856	......	568 931 051	......	896 377 125
Grand totals ...	......	1 364 077 175	......	1 520 263 436	......	1 788 159 537	......	1 972 181 456	......	2 957 206 963

Table 3-3—Mineral Production for the 10 Years, 1975–1984—Continued

Description	1980		1981		1982		1983		1984	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Metals		$		$		$		$		$
Antimony ... kg	78 654	416 080	68 323	360 745	213 519	1 161 543	263 724	1 432 021	354 375	2 023 472
Bismuth ... kg	23 501	136 306	47 300	102 641	27 305	83 007	47 427	215 319	9 547	112 857
Cadmium ... kg	92 360	560 679	101 962	371 077	147 656	286 265	138 171	423 843	114 420	552 726
Copper ... kg	264 674 830	670 623 616	290 088 241	611 282 050	279 873 599	495 009 799	282 864 697	561 111 733	280 070 497	517 765 234
Gold—placer ... g	280 104	6 213 376	291 705	4 540 289	175 607	2 467 470	287 783	4 317 204	430 864	6 405 983
lode, fine ... g	7 197 312	163 930 073	7 468 769	131 542 422	7 511 908	115 802 480	7 693 571	126 555 114	6 813 576	111 731 223
Iron concentrates ... t	653 324	13 670 233	602 272	14 274 498	774 951	19 630 010	496 823	13 078 465	198 464	6 584 179
Lead ... kg	76 709 447	66 096 223	84 854 093	61 529 276	83 746 551	43 035 587	112 941 984	48 778 436	85 147 484	37 899 396
Molybdenum ... kg	11 209 501	288 934 398	12 933 244	198 240 391	14 747 888	154 990 970	10 778 825	87 584 823	12 164 806	113 803 442
Platinum ... g	...	...	...	...	...	...	...	...	...	...
Silver ... g	203 801 811	156 548 306	403 754 797	152 420 716	499 565 577	158 260 320	402 325 338	180 372 129	363 378 002	121 364 145
Tin ... kg	139 517	2 438 881	150 341	2 198 138	115 261	1 568 666	136 347	1 985 213	208 554	2 830 486
Tungsten (WO$_3$) ... kg	...	...	...	...	104 730	1 114 350	...	...	...	...
Zinc ... kg	67 481 328	49 363 417	79 214 552	67 026 535	75 182 699	63 571 545	95 286 818	79 634 214	95 334 645	115 225 652
Others ...	...	10 070 592	...	2 793 757	...	506 368	...	527 348	...	601 998
Subtotals ...	...	1 429 002 180	...	1 246 682 535	...	1 057 488 380	...	1 106 015 862	...	1 036 900 793
Industrial Minerals										
Asbestos ... t	100 089	81 688 936	90 914	76 770 285	76 084	57 032 422	81 653	53 395 853	92 123	75 295 765
Diatomite ... t	3 615	138 273	3 600	155 232	137	6 850	1 955	158 260	4 100	327 500
Fluxes (quartz, limestone) ... t	43 986	93 135	48 313	509 678	53 801	1 018 576	54 076	1 166 314	16 652	58 759
Granules (quartz, limestone, granite) ... t	31 393	1 694 947	28 297	1 756 810	20 962	1 400 812	51 919	1 056 863	13 293	520 579
Gypsum and gypsite ... t	751 067	5 387 949	684 924	5 804 770	415 458	5 468 093	459 815	4 917 144	411 829	4 075 967
Jade ... kg	449 156	1 580 241	59 208	133 598	78 681	320 861	96 268	577 172	123 969	1 040 713
Sulphur ... t	359 413	21 712 359	507 566	33 337 562	423 892	29 115 860	483 733	24 862 954	508 917	27 215 071
Others ...	...	3 630 167	...	3 996 907	...	1 280 744	...	3 361 874	...	6 135 167
Subtotals ...	...	115 926 007	...	122 464 842	...	95 644 218	...	89 496 434	...	114 669 521
Structural Materials										
Cement ... t	1 351 320	90 881 086	955 922	82 372 375	749 571	69 265 713	853 064	71 080 982	939 354	69 939 148
Clay products ...	...	10 387 121	...	10 292 772	...	5 853 261	...	7 335 946	...	7 230 396
Lime and limestone ... t	3 129 762	9 945 044	2 659 406	9 400 205	2 575 441	10 465 577	2 711 559	12 126 785	2 772 103	12 785 416
Rubble, riprap, and crushed rock ... t	7 019 167	32 436 456	3 168 694	11 100 383	2 652 976	12 898 647	3 371 759	17 910 535	4 068 127	24 969 600
Sand and gravel ... t	45 278 202	98 666 100	42 361 930	87 603 864	26 702 329	65 648 899	39 560 774	99 919 233	34 628 047	85 156 975
Building-stone ... t	91	9 850	383	11 875	145	24 547	181	28 047	170	15 760
Subtotals ...	...	242 325 657	...	200 786 479	...	164 156 644	...	208 401 528	...	200 097 295
Coal										
Sold and used ... t	10 823 530	461 492 857	11 752 621	554 271 292	10 645 742	566 878 240	11 480 298	555 789 196	20 739 725	1 007 519 670
Total solid minerals .	...	2 248 746 701	...	2 124 205 148	...	1 884 167 482	...	1 959 703 020	...	2 359 187 279
Petroleum and Natural Gas										
Crude oil ... m^3	2 002 128	189 561 479	2 035 953	236 170 548	2 078 258	333 892 930	2 078 771	402 075 887	2 094 156	434 600 112
Field condensate ... m^3	36 885	3 489 431	27 871	3 233 036	20 771	3 337 069	17 636	3 411 155	14 102	2 926 650
Plant condensate ... m^3	133 601	11 641 991	124 946	13 284 259	135 185	19 765 399	113 984	20 225 321	131 441	25 023 699
Natural gas delivered to pipeline ... 10^{3}m^3	8 931 833	612 545 107	8 062 681	616 795 096	7 188 561	542 664 470	6 899 911	455 187 128	7 769 368	518 683 014
Butane ... m^3	89 556	6 491 914	84 635	9 953 076	89 443	9 436 236	80 291	12 897 946	81 972	11 076 111
Propane ... m^3	75 507	4 572 704	64 118	5 080 069	68 783	3 806 451	62 494	5 553 842	59 687	5 440 470
Total petroleum and natural gas ...	...	828 302 626	...	884 516 084	...	912 902 555	...	899 351 279	...	997 750 056
Grand totals ...	...	3 077 049 327	...	3 008 721 232	...	2 797 070 037	...	2 859 054 299	...	3 356 937 335

Table 3-4—Comparison of Total Quantity and Value of Production, and Quantity and Value of Production Paid for to Mines

Metals		1984 Total Production		1984 Production Paid for to Mines	
		Quantity	Value	Quantity	Value
			$		$
Antimony	kg	354 375	2 023 472	....	....
Bismuth	kg	9 547	112 857	....	....
Cadmium	kg	114 420	552 726	1 128	3 309
Copper	kg	280 070 497	517 765 234	279 942 159	375 230 344
Gold—placer	g	430 864	6 405 983	430 864	6 405 983
Gold—lode, fine	g	6 813 576	111 731 223	6 742 983	89 904 254
Iron concentrates	t	198 464	6 584 179	144 522	5 006 411
Lead	kg	85 147 484	37 899 396	85 147 484	22 858 133
Molybdenum	kg	12 164 806	113 803 442	12 164 806	113 803 442
Silver	g	363 378 002	121 364 145	363 378 002	84 191 965
Tin	kg	208 554	2 830 486	169 356	2 298 569
Zinc	kg	95 334 645	115 225 652	85 622 554	61 089 106
Others		....	601 998	....	239 154
Totals		....	1 036 900 793	....	761 030 670

NOTE: For metals, the total quantity and value of production include the quantities paid for to the mines, and the smelter and refining production that can be attributed to the mines but is not paid for. The quantity and value paid for to the mines, excluding outward transportation costs, smelting and refining costs, penalties and deductions, are shown separately for comparative purposes.

Table 3-5—Exploration and Development Expenditures, 1974–1984

	Physical Work and Surveys	Administration, Overhead, Land Costs, Etc.	Construction, Machinery and Equipment, Other Capital Costs	Totals
A. Exploration on Undeclared Mines	$	$	$	$
Metal mines—				
1974	18 773 326	6 525 878	128 144	25 427 348
1975	16 366 152	5 298 367	442 327	22 106 846
1976	20 437 180	6 365 331	381 416	27 183 927
1977	19 097 099	6 974 231	106 059	26 177 389
1978	22 724 774	5 715 214	1 035 353	29 475 341
1979	42 789 552	10 438 163	583 114	53 810 829
1980	74 378 109	14 367 266	4 107 339	92 852 714
1981	88 908 669	19 080 910	10 976 496	118 946 075
1982	30 868 724	11 063 588	422 868	42 355 180
1983	43 176 369	16 611 376	1 006 445	60 794 190
1984	70 840 901	22 875 067	1 142 710	94 858 678
Coal mines—				
1974	3 450 746	884 849	18 958	4 354 553
1975	9 955 507	3 057 843	....	13 013 350
1976	9 234 269	3 678 893	....	12 913 162
1977	14 741 425	4 797 788	....	19 539 213
1978	15 289 351	4 511 572	....	19 800 923
1979	11 765 168	6 073 861	....	17 839 029
1980	9 830 425	5 703 387	....	15 533 812
1981	25 557 948	9 866 432	1 932	35 426 312
1982	7 396 523	4 194 832	....	11 791 355
1983	7 213 243	5 913 855	....	13 127 098
1984	7 383 078	4 414 857	....	11 797 935
Others—				
1974	42 706	11 134	....	53 840
1975	90 025	35 679	....	125 704
1976	73 453	47 760	....	121 213
1977	327 113	9 860	222 092	559 065
1978	342 100	117 180	....	459 280
1979	135 062	149 131	....	284 193
1980	1 340 398	189 292	....	1 529 690
1981	808 742	30 870	367 106	1 206 718
1982	980 203	150 720	....	1 130 923
1983	1 225 129	773 100	80 000	2 078 229
1984	1 117 773	63 646	....	1 181 419
Totals—				
1974	22 266 778	7 421 861	147 102	29 835 741
1975	26 411 684	8 391 889	442 327	35 245 900
1976	29 744 902	10 091 984	381 416	40 218 302
1977	34 165 637	11 781 879	328 151	46 275 667
1978	38 356 225	10 343 966	1 035 353	49 735 544
1979	54 689 782	16 661 155	583 114	71 934 051
1980	85 548 932	20 259 945	4 107 339	109 916 216
1981	115 275 359	28 958 212	11 345 534	155 579 105
1982	39 445 450	15 409 140	422 868	55 277 458
1983	51 614 741	23 298 331	1 086 445	75 999 517
1984	79 341 752	27 353 570	1 142 710	107 838 032
B. Exploration on Declared or Operating Mines				
Metal mines—				
1974	2 652 243	762 224	278 500	3 692 967
1975	2 792 378	3 090 135	....	5 882 513
1976	8 359 413	83 304	....	8 442 717
1977	2 988 366	2 020 259	....	5 008 625
1978	6 562 912	1 729 402	....	8 292 314
1979	6 946 143	1 585 176	263 586	8 794 905
1980	26 712 536	4 345 682	2 551 716	33 609 934
1981	7 559 289	466 704	8 000	8 033 993
1982	4 508 057	7 947 145	....	12 455 202
1983	2 586 725	919 409	351 155	3 857 289
1984	4 608 602	1 250 945	16 345 671	22 205 218
Coal mines—				
1974	488 308	104 259	....	592 567
1975	1 000 000	....	....	1 000 000
1976	665 000	28 000	....	693 000
1977	5 978 043	25 115 000	....	31 093 043
1978	4 052 774	510 612	....	4 563 386
1979	3 376 551	398 984	....	3 775 535
1980	12 504 905	8 510 426	....	21 015 331
1981	6 008 376	348 780	....	6 357 156
1982	11 408 367	2 710 714	....	14 119 081
1983	10 019 044	1 067 005	....	11 086 049
1984	556 000	....	....	555 000

Table 3-5—Exploration and Development Expenditures, 1974–1984—Continued

	Physical Work and Surveys	Administration, Overhead, Land Costs, Etc.	Construction, Machinery and Equipment, Other Capital Costs	Totals
B. Exploration on Declared or Operating Mines—Continued				
Others—				
1974	4 236	....	....	4 236
1975	36 242	2 700	....	38 942
1976	214 081	30 000	....	244 081
1977	106 896	403 300	....	510 196
1978	12 025	....	....	12 025
1979	35 200	....	1 300	36 500
1980	187 332	....	....	187 332
1981	60 300	7 350	....	67 650
1982	36 900	9 300	....	46 200
1983	666 507	13 000	....	679 507
1984	154 168	....	....	154 168
Totals—				
1974	3 144 787	866 483	278 500	4 289 770
1975	3 828 620	3 092 835	....	6 921 455
1976	9 238 494	141 304	....	9 379 798
1977	9 073 305	27 538 559	....	36 611 864
1978	10 627 711	2 240 014	....	12 867 725
1979	10 357 894	1 984 160	264 886	12 606 940
1980	39 404 773	12 856 108	2 551 716	54 812 597
1981	13 627 965	822 834	8 000	14 458 799
1982	15 953 324	10 667 159	....	26 620 483
1983	13 272 276	1 999 414	351 155	15 622 845
1984	5 318 770	1 290 945	16 345 671	22 915 386
C. Development on Declared Mines				
Metal mines—				
1974	1 280 513	1 028 199	1 985 000	4 293 712
1975	....	57 166	840 344	897 510
1976	512 197	974 985	12 447 569	13 934 751
1977	380 419	1 132 316	33 672 153	35 184 888
1978	133 335	895 892	....	1 029 227
1979	3 482 962	1 351 567	54 559 204	59 393 733
1980	83 119 989	736 527	23 446 243	107 302 759
1981	19 072 107	6 888 019	29 993 101	55 953 227
1982	11 022 201	425 555	4 577 981	16 025 737
1983	91 500	449 460	....	540 960
1984	2 594 254	555 150	8 998 537	12 147 941
Coal mines—				
1974	320 098	256 055	111 500	687 653
1975	....	....	....	....
1976	1 425 312	583 304	....	2 008 616
1977	1 725 484	247 313	....	1 972 797
1978	30 957	38 910	....	69 867
1979	981 517	350 157	....	1 331 674
1980	3 296 000	69 000	43 280 261	46 645 261
1981	7 812 359	1 771 320	115 229 391	124 813 070
1982	323 078 469	341 915	....	323 420 384
1983	....	....	....	....
1984	....	....	....	....
Others—				
1974	23 242	37 988	2 883 584	2 944 814
1975	....	....	....	....
1976	....	3 155	18 001 500	18 004 655
1977	64 689	708	40 000	105 397
1978	7 045	2 159	10 000	19 204
1979	....	....	....	....
1980	....	....	....	....
1981	....	....	....	....
1982	....	....	....	....
1983	1 700	2 500	....	4 200
1984	691 275	67 530	3 500	762 305
Totals—				
1974	1 623 853	1 322 242	4 980 084	7 926 179
1975	....	57 166	840 344	897 510
1976	1 937 509	1 561 444	30 449 069	33 948 022
1977	2 170 592	1 380 337	33 712 153	37 263 082
1978	171 337	936 961	10 000	1 118 298
1979	4 464 479	1 701 724	54 559 204	60 725 407
1980	86 415 989	805 527	66 726 504	153 948 020
1981	26 884 466	8 659 339	145 222 492	180 766 297
1982	334 100 670	767 470	4 577 981	339 446 121
1983	93 200	451 960	....	545 160
1984	3 285 529	622 680	9 002 037	12 910 246
D. Development on Operating Mines				
Metal mines—				
1974	20 933 501	1 722 680	46 732 326	69 388 507
1975	9 013 375	5 804 924	24 548 602	39 366 901
1976	6 937 229	404 226	41 881 126	49 222 581
1977	14 491 378	1 722 479	45 859 006	62 072 863
1978	10 424 872	575 164	17 908 816	28 908 852
1979	27 395 046	2 672 011	67 831 381	97 898 438
1980	33 379 015	2 541 622	250 726 066	286 646 703
1981	96 533 183	9 803 477	312 609 605	418 946 265
1982	39 163 981	2 960 035	71 110 422	113 234 438
1983	46 535 830	3 503 403	37 156 050	87 195 283
1984	29 415 284	307 782	89 140 116	118 863 182
Coal mines—				
1974	9 027 818	....	16 607 506	25 635 324
1975	3 300 000	....	59 000 000	62 300 000
1976	16 043 383	55 377	20 767 397	36 866 157
1977	30 466 894	....	25 943 377	56 410 271
1978	31 222 528	....	15 621 757	46 844 285
1979	46 473 678	628 021	40 698 097	87 799 796
1980	63 173 491	782 244	68 817 158	132 752 893
1981	6 092 432	18 779 550	247 123 358	271 995 340
1982	85 297 885	1 335 060	281 426 140	368 059 085
1983	86 751 744	8 800 780	236 220 864	331 773 388
1984	217 331 846	55 841 871	198 886 831	472 060 548
Others—				
1974	6 198 552	146 182	16 606 229	22 950 963
1975	17 350 175	124 860	18 077 384	35 552 419
1976	58 980	79 300	1 389 956	1 528 236
1977	432 731	108 500	931 521	1 472 752
1978	102 248	9 579	1 256 869	1 368 696
1979	187 044	30 700	1 033 645	1 251 389
1980	1 139 216	3 461	2 889 032	4 031 709
1981	702 587	....	1 272 328	1 974 915
1982	367 968	....	858 800	1 226 768
1983	1 008 083	221 745	1 337 890	2 567 718
1984	187 058	....	1 134 768	1 321 826
Totals—				
1974	36 159 871	1 868 862	79 946 061	117 974 794
1975	29 663 550	5 929 784	101 625 986	137 219 320
1976	23 039 592	538 903	64 038 479	87 616 974
1977	45 391 003	1 830 979	72 733 904	119 955 886
1978	41 749 648	584 743	34 787 442	77 121 833
1979	74 055 768	3 330 732	109 563 123	186 949 623
1980	97 691 722	3 307 327	322 432 256	423 431 305
1981	103 328 202	28 583 027	561 005 291	692 916 520
1982	124 829 834	4 304 095	353 386 362	482 520 291
1983	134 295 657	12 525 928	274 714 804	421 536 389
1984	246 934 188	56 149 653	289 161 715	592 245 556

Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1984

Year	Gold (Placer)		Gold (Fine)		Silver		Copper	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	g	$	g	$	g	$	kg	$
1858–1890	100 978 533	55 192 163	....	....	6 876 531	214 152	....	....
1891–1900	11 703 748	6 397 183	19 682 165	12 858 353	700 977 829	13 561 194	16 064 375	4 365 210
1901–1910	15 787 261	8 628 660	72 224 836	47 998 179	971 114 910	16 973 507	172 344 737	56 384 783
1911–1920	8 656 275	4 731 100	63 112 995	41 942 862	994 340 920	22 572 682	231 326 501	100 770 459
1921	426 733	233 200	4 222 699	2 804 197	83 150 418	1 591 201	17 706 790	4 879 624
1922	674 624	368 800	6 153 915	4 089 684	220 872 076	4 554 781	14 678 125	4 329 754
1923	768 555	420 000	5 575 057	3 704 994	187 643 964	3 718 129	26 181 346	8 323 266
1924	769 799	420 750	7 704 711	5 120 535	259 454 010	5 292 184	29 413 222	8 442 870
1925	512 453	280 092	6 522 890	4 335 069	238 088 613	5 286 818	32 797 475	10 153 269
1926	650 426	355 503	6 264 984	4 163 859	334 312 337	6 675 606	40 523 625	12 324 421
1927	285 868	156 247	5 536 365	3 679 601	325 654 164	5 902 043	40 461 530	11 525 011
1928	262 012	143 208	5 619 130	3 734 609	330 536 775	6 182 461	44 410 233	14 265 242
1929	217 192	118 711	4 516 871	3 002 020	309 791 230	5 278 194	46 626 180	18 612 850
1930	278 527	152 235	5 002 482	3 324 975	352 342 964	4 322 185	41 894 588	11 990 466
1931	534 225	291 992	4 545 175	3 020 837	234 837 945	2 254 979	29 090 879	5 365 690
1932	634 501	395 542	5 649 891	4 263 389	222 406 822	2 264 729	22 955 299	3 228 892
1933	744 233	562 787	6 954 289	6 394 645	218 397 615	2 656 526	19 572 164	3 216 701
1934	783 205	714 431	9 244 309	10 253 952	267 920 527	4 088 280	22 521 530	3 683 662
1035	961 985	895 058	11 363 263	12 856 419	288 323 068	6 005 996	17 884 241	3 073 428
1936	1 349 528	1 249 940	12 583 590	14 172 367	296 944 198	4 308 330	9 830 071	2 053 828
1937	1 684 321	1 558 245	14 331 671	16 122 767	351 630 830	5 073 962	20 891 260	6 023 411
1938	1 796 478	1 671 015	17 340 607	19 613 624	337 827 661	4 722 288	29 832 572	6 558 575
1939	1 547 250	1 478 492	18 267 912	21 226 957	336 577 786	4 381 365	33 227 590	7 392 862
1940	1 215 101	1 236 928	18 149 347	22 461 516	383 436 042	4 715 315	35 371 049	7 865 085
1941	1 361 534	1 385 962	17 760 622	21 984 501	378 700 797	4 658 545	30 134 516	6 700 693
1942	1 023 413	1 041 772	13 825 843	17 113 943	301 011 133	4 080 775	22 723 823	5 052 856
1943	454 104	462 270	6 979 607	8 639 516	265 193 820	3 858 496	19 190 263	4 971 132
1944	355 601	361 977	5 804 815	7 185 332	177 453 003	2 453 293	16 465 584	4 356 070
1945	391 556	398 591	5 454 626	6 751 860	191 510 720	2 893 934	11 726 375	3 244 472
1946	489 219	475 361	3 658 086	4 322 241	197 994 264	5 324 959	7 938 069	2 240 070
1947	216 757	200 585	7 566 800	8 514 870	177 550 262	4 110 092	18 952 769	8 519 741
1948	632 386	585 200	8 902 612	10 018 050	209 016 328	5 040 101	19 515 886	9 616 174
1949	556 308	529 524	8 969 981	10 382 256	237 559 178	5 671 082	24 882 500	10 956 550
1950	595 125	598 717	8 832 723	10 805 553	295 772 610	7 667 950	19 147 001	9 889 458
1951	736 861	717 911	8 126 405	9 627 947	255 632 882	7 770 983	19 617 612	11 980 155
1952	545 982	494 756	7 955 805	8 765 889	274 042 530	7 326 803	19 053 280	13 054 893
1953	443 062	403 230	7 886 228	8 727 294	260 606 407	7 019 272	22 235 441	14 869 544
1954	270 098	238 967	8 036 642	8 803 279	305 630 613	8 154 145	22 747 578	14 599 693
1955	238 436	217 614	7 541 762	8 370 306	245 811 643	6 942 995	20 065 928	16 932 549
1956	120 213	109 450	5 963 782	6 603 628	261 423 017	7 511 866	19 667 923	17 251 872
1957	91 318	80 990	6 948 504	7 495 170	252 847 111	7 077 166	14 237 029	8 170 465
1958	175 732	157 871	6 044 992	6 604 149	218 998 027	6 086 854	5 741 837	2 964 529
1959	235 450	208 973	5 385 360	5 812 511	192 779 535	5 421 417	7 363 374	4 497 991
1960	119 653	107 418	6 394 155	6 979 441	231 612 937	6 600 183	14 997 694	9 583 724
1961	106 248	99 884	4 970 913	5 667 253	229 353 429	6 909 140	14 375 361	8 965 149
1962	103 106	96 697	4 940 712	5 942 101	192 521 474	7 181 907	49 431 850	33 209 215
1963	143 696	135 411	4 820 312	5 850 458	199 764 616	8 861 050	53 635 704	36 238 007
1964	57 292	55 191	4 307 361	5 227 884	163 901 675	7 348 938	52 414 456	38 609 136
1965	26 935	25 053	3 642 908	4 419 089	154 646 729	6 929 793	38 644 540	32 696 081
1966	47 743	44 632	3 717 057	4 506 646	172 594 622	7 729 939	47 990 080	56 438 255
1967	27 713	25 632	3 923 861	4 763 688	192 239 525	10 328 695	78 352 932	88 135 172
1968	20 839	19 571	3 853 537	4 672 242	221 791 325	16 475 795	73 024 968	87 284 148
1969	12 410	11 720	3 654 012	4 427 506	179 169 889	11 100 491	75 937 956	111 592 416
1970	15 272	14 185	3 135 462	3 685 476	202 521 462	12 041 181	96 329 694	124 657 958
1971	5 505	4 647	2 668 046	3 031 844	238 670 301	11 968 046	127 286 040	131 037 918
1972	21 492	26 905	3 782 871	6 995 448	215 420 498	11 519 660	211 832 288	209 403 822
1973	119 156	311 524	5 784 723	18 117 268	236 987 318	19 552 997	317 603 055	582 803 251
1974	45 162	232 512	5 001 082	26 749 083	181 695 950	28 440 365	287 547 048	541 644 913
1975	43 744	232 204	4 819 241	25 082 494	196 305 885	30 545 947	258 497 599	331 693 850
1976	26 064	115 613	5 393 477	21 761 502	239 720 882	32 532 836	263 618 197	378 984 941
1977	46 170	289 075	5 906 336	31 301 931	241 503 007	37 934 098	275 224 115	384 736 661
1978	36 515	295 001	6 542 332	47 951 880	227 271 890	45 071 509	273 692 676	431 694 395
1979	214 106	2 649 918	8 062 810	101 481 156	214 117 518	94 700 656	272 163 001	656 359 923
1980	280 104	6 213 376	7 197 312	163 930 073	203 801 811	156 548 306	264 674 830	670 623 616
1981	291 705	4 540 289	7 468 769	131 542 422	403 754 797	152 420 716	290 088 241	611 282 050
1982	175 607	2 467 470	7 511 908	115 802 480	499 565 577	158 260 320	279 873 599	495 009 799
1983	287 783	4 317 204	7 693 571	126 555 114	402 325 338	180 372 129	282 864 697	561 111 733
1984	430 864	6 405 983	6 813 576	111 731 223	363 378 002	121 364 145	280 070 497	517 765 234
Totals	164 860 872	125 059 118	614 220 693	1 435 849 407	18 957 629 572	1 434 406 477	5 617 183 288	7 616 259 633

Table 3-6—Production of Gold, Silver, Copper, Lead, Zinc, Molybdenum, and Iron Concentrates, 1858–1984—Continued

Year	Lead		Zinc		Molybdenum		Iron Concentrates	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	kg	$	kg	$	kg	$	t	$
1858–1890	473 729	45 527	...	...	...	...	27 097	70 879
1891–1900	93 002 804	7 581 619	...	...	...	...	11 820	45 602
1901–1910	184 989 089	17 033 102	5 753 423	894 169	...	...	17 738	68 436
1911–1920	191 859 042	21 991 616	118 086 182	19 303 993	11 946	36 698	3 358	18 510
1921	18 779 664	1 693 354	22 416 133	1 952 065	...	...	916	5 050
1922	30 593 731	3 480 306	25 921 103	2 777 322	...	...	1 089	3 600
1923	43 845 439	6 321 770	26 464 465	3 278 903	...	...	220	1 337
1924	77 284 697	12 415 917	35 893 017	4 266 741	...	...	...	...
1925	107 908 698	18 670 329	44 568 438	7 754 450	...	...	...	...
1926	119 305 027	17 757 535	64 807 554	10 586 610	...	...	...	...
1927	128 364 347	14 874 292	65 872 809	8 996 135	...	...	...	...
1928	138 408 812	13 961 412	82 445 946	9 984 613	...	...	18	...
1929	139 705 336	15 555 189	78 061 406	9 268 792	...	...	...	...
1930	145 966 952	12 638 198	113 614 910	9 017 005	...	...	...	...
1931	118 796 232	7 097 812	91 657 703	5 160 911	...	...	...	...
1932	114 308 115	5 326 432	87 143 752	4 621 641	...	...	...	...
1933	123 235 512	6 497 719	88 887 198	6 291 416	...	...	...	...
1934	157 562 183	8 461 859	113 013 038	7 584 199	...	...	...	...
1935	156 156 723	10 785 930	116 227 650	7 940 860	...	...	...	...
1936	171 444 146	14 790 028	115 475 574	8 439 373	...	...	...	...
1937	190 107 902	21 417 049	132 081 905	14 274 245	...	...	...	...
1938	187 323 227	13 810 024	135 395 388	9 172 822	...	...	...	...
1939	171 794 338	12 002 390	126 283 585	8 544 375	...	...	...	...
1940	211 758 089	15 695 467	141 529 456	10 643 026	...	...	...	...
1941	207 218 262	15 358 976	166 861 962	12 548 031	...	...	...	...
1942	230 060 714	17 052 054	175 646 590	13 208 636	...	...	...	...
1943	199 196 604	16 485 902	152 474 485	13 446 018	...	...	...	...
1944	132 866 893	13 181 530	126 126 765	11 956 725	...	...	...	...
1945	152 849 156	16 848 823	133 714 538	18 984 581	...	...	...	...
1946	156 879 853	23 345 731	124 406 109	21 420 484	...	...	...	...
1947	142 306 192	42 887 313	114 761 068	28 412 593	...	...	...	...
1948	145 165 821	57 734 770	122 610 001	37 654 211	...	...	616	3 735
1949	120 373 215	41 929 866	130 736 145	38 181 214	...	...	4 964	27 579
1950	128 830 683	41 052 905	131 697 238	43 769 392	...	...	...	...
1951	124 037 181	50 316 015	153 091 761	67 164 754	...	...	102 997	790 000
1952	129 250 197	45 936 692	169 130 882	59 189 656	...	...	816 898	5 474 924
1953	135 004 129	39 481 244	173 407 848	40 810 618	...	...	899 240	6 763 105
1954	150 807 088	45 482 505	151 555 559	34 805 755	...	...	486 018	3 733 891
1955	137 241 656	45 161 245	194 680 177	52 048 909	...	...	554 223	3 228 756
1956	128 691 681	44 702 619	201 327 284	58 934 801	...	...	335 616	2 190 847
1957	127 732 462	39 568 086	203 787 462	50 206 681	...		324 174	2 200 637
1958	133 615 439	34 627 075	195 952 146	43 234 839	...	...	571 769	4 193 442
1959	130 372 360	33 542 306	182 498 693	44 169 198	...	...	770 421	6 363 848
1960	151 321 570	38 661 912	182 977 897	50 656 726	2 456	9 500	1 052 651	10 292 847
1961	174 307 617	42 313 569	175 970 780	45 370 891	...	...	1 211 147	12 082 540
1962	152 080 806	34 537 454	187 528 084	51 356 376	...	...	1 627 342	18 326 911
1963	142 869 197	37 834 714	182 734 698	53 069 163	...	...	1 869 009	20 746 424
1964	121 896 644	39 402 293	181 797 313	58 648 561	12 812	47 063	1 816 684	20 419 487
1965	113 480 794	43 149 171	141 179 547	48 666 933	3 306 274	12 405 344	1 964 410	21 498 581
1966	95 929 798	34 436 934	138 401 395	47 666 540	7 754 088	27 606 061	1 952 074	20 778 934
1967	94 406 546	31 432 079	119 217 472	39 248 539	7 945 782	31 183 064	1 954 468	20 820 765
1968	105 063 971	32 782 257	135 803 151	43 550 181	8 980 988	32 552 722	1 900 311	21 437 569
1969	95 286 815	33 693 539	134 565 199	46 639 024	12 064 350	47 999 442	1 882 266	19 787 845
1970	97 448 607	35 096 021	125 005 208	44 111 055	14 186 706	52 561 796	1 704 650	17 391 883
1971	112 865 575	34 711 408	138 549 629	49 745 789	9 926 694	36 954 846	1 750 738	18 153 612
1972	88 109 663	28 896 566	121 719 968	47 172 894	12 719 391	43 260 349	1 139 698	11 642 379
1973	84 890 924	30 477 936	137 380 768	62 564 751	13 785 264	51 851 509	1 420 160	12 906 063
1974	55 252 692	23 333 016	77 733 732	59 582 753	13 789 825	60 791 552	1 306 930	12 742 227
1975	70 603 483	24 450 158	99 668 230	80 572 872	13 026 627	71 201 391	1 305 840	15 273 878
1976	85 407 582	32 796 533	106 498 987	65 499 108	14 088 686	94 109 138	1 255 277	14 760 526
1977	78 172 646	42 316 293	103 780 228	61 301 001	15 521 970	142 057 947	445 317	7 362 345
1978	81 064 539	51 640 564	95 618 111	52 048 701	13 055 203	167 714 272	615 569	11 597 462
1979	84 451 905	88 100 363	88 418 642	61 890 891	10 766 497	321 228 104	668 026	13 008 475
1980	76 709 447	66 096 223	67 481 328	49 363 417	11 179 501	288 934 398	653 324	13 670 233
1981	84 854 093	61 529 276	79 214 552	67 026 535	12 933 224	198 240 391	602 272	14 274 498
1982	83 746 551	43 035 587	75 182 699	63 571 545	14 747 888	154 990 970	774 951	19 630 010
1983	112 941 984	48 778 436	95 286 818	79 634 214	10 778 825	87 584 823	496 823	13 078 465
1984	85 147 484	37 899 396	95 334 645	115 225 652	12 164 806	113 803 442	198 464	6 584 179
Totals	8 363 784 353	1 962 002 231	7 923 116 429	2 305 084 874	232 149 803	2 037 124 822	36 497 593	423 452 316

Table 3-7A—Mineral Production by Mining

Division	Period	Placer Gold		Metals	Industrial Minerals	Structural Materials
		Quantity	Value			
		g	$	$	$	$
Alberni	1983			37 911 193		662 710
	1984			**28 709 516**		**614 103**
	To Date	50 294	33 253	509 952 037	9 398	14 342 961
Atlin	1983	166 942	2 504 125	20 538		
	1984	**272 893**	**4 071 623**	**4 656**		**9 263**
	To Date	23 697 948	28 602 082	38 311 006	20 325	512 332
Cariboo	1983	71 576	1 073 410	65 406 772	158 260	21 366 269
	1984	**128 954**	**1 989 625**	**67 281 990**	**327 500**	**13 611 051**
	To Date	81 564 530	59 098 661	1 066 032 964	1 822 037	131 190 332
Clinton	1983					1 752 368
	1984				**5 000**	**714 295**
	To Date	319 957	299 053	848 537	167 427	18 817 210
Fort Steele	1983			141 581 223	4 068 104	3 119 798
	1984	**1 278**	**20 721**	**158 548 619**	**2 779 736**	**1 855 980**
	To Date	640 519	492 808	3 653 301 002	51 443 765	26 584 194
Golden	1983				6 997 599	1 654 438
	1984				**7 968 657**	**684 667**
	To Date	16 403	51 639	67 075 470	65 248 886	9 762 829
Greenwood	1983			4 081 002	130 000	1 275 480
	1984			**3 765 338**	**160 000**	**399 358**
	To Date	159 178	132 270	273 000 596	3 245 230	7 952 759
Kamloops	1983			331 246 860		21 299 262
	1984			**349 888 240**		**14 973 839**
	To Date	883 329	1 021 423	3 041 091 955	6 542 538	218 028 169
Liard	1983			19 389 074	66 318 212	11 922 081
	1984	**11 069**	**165 880**	**16 292 151**	**93 684 331**	**7 119 935**
	To Date	1 609 902	2 045 372	96 412 438	977 959 466	69 680 489
Lillooet	1983			19 237	18 060	980 274
	1984				**30 317**	**900 695**
	To Date	2 895 325	1 965 519	148 522 318	521 472	9 312 536
Nanaimo	1983			160 717 621	78 068	13 693 798
	1984			**144 780 943**	**58 088**	**13 644 320**
	To Date	30 735	65 239	1 780 939 480	3 354 530	189 701 545
Nelson	1983			38 699	906 851	1 582 300
	1984			**337 320**	**338 805**	**2 594 662**
	To Date	111 535	89 026	410 091 230	14 874 401	27 326 791
New Westminster	1983			9 921 926		30 225 133
	1984			**8 869 217**	**2 659**	**45 170 065**
	To Date	975 418	597 152	86 617 621	1 614 284	496 681 413
Nicola	1983			1 024 361		1 142 454
	1984			**2 321 088**		**4 152 655**
	To Date	7 278	4 764	519 880 763	10 050	10 136 880
Omineca	1983	49 130	737 652	116 620 296	1 003 053	3 353 457
	1984	**16 472**	**235 878**	**114 283 504**	**1 825 087**	**2 706 408**
	To Date	1 855 501	3 037 827	2 061 606 580	5 222 033	45 306 279
Osoyoos	1983			38 288 637	26 974	1 077 669
	1984			**38 921 537**	**19 786**	**471 952**
	To Date	9 472	47 402	828 247 880	6 960 439	11 068 211
Revelstoke	1983	135	2 017	16 162 250		1 786 314
	1984	**198**	**2 256**	**7 082 753**		**300 174**
	To Date	241 773	272 448	38 688 905		13 706 890
Similkameen	1983			51 048 450		
	1984			**45 722 972**		
	To Date	1 418 222	916 258	708 726 831	18 558	7 746 859
Skeena	1983			66 985 767		5 301 636
	1984			**26 068 085**		**2 067 508**
	To Date	143 447	108 951	919 802 161	1 240 215	64 048 198
Slocan	1983			6 540 049		2 338 733
	1984			**3 088 265**		**448 914**
	To Date	11 384	9 397	326 942 453		8 716 827
Trail Creek	1983			57 850		299 354
	1984			**25 046**		**141 530**
	To Date	26 469	24 260	91 235 521		9 289 646
Vancouver	1983					68 736 765
	1984			**69 746**		**73 059 819**
	To Date	6 026	9 723	360 664 120	7 066 964	631 512 220
Vernon	1983			6 298		3 500 676
	1984					**2 585 566**
	To Date	116 328	532 340	405 005	244 239	38 636 940
Victoria	1983					11 330 559
	1984			**3 074**		**11 910 536**
	To Date	19 533	15 680	24 815 360	190 811	455 373 428
Not Assigned	1983			34 630 555	9 791 233	
	1984			**14 590 750**	**7 469 555**	
	To Date	48 050 366	25 586 571	536 108 586	132 615 573	80 143 885
Totals	1983	287 783	4 317 204	1 101 698 658	89 496 434	208 401 528
	1984	**430 864**	**6 405 983**	**1 030 404 810**	**114 669 521**	**200 097 295**
	To Date	164 860 872	125 059 118	17 589 320 819	1 280 392 641	2 595 579 823

Divisions, 1983 and 1984, and Total to Date

Coal		Crude Oil and Condensates		Natural Gas Delivered to Pipeline		Butane and Propane		Division Totals
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
t	$	m^3	$	10^3m^3	$	m^3	$	$
......	......	......	......	......	......	......	......	38 573 903
......	......	......	......	......	......	......	......	29 323 619
......	......	......	......	......	......	......	......	524 337 649
......	......	......	......	......	......	......	......	2 524 663
......	......	......	......	......	......	......	......	4 085 542
......	......	......	......	......	......	......	......	67 445 745
......	......	......	......	......	......	......	......	88 004 711
......	......	......	......	......	......	......	......	83 130 166
263	1 100	......	......	......	......	......	......	1 258 145 094
......	......	......	......	......	......	......	......	1 752 368
......	......	......	......	......	......	......	......	719 295
......	......	......	......	......	......	......	......	20 132 227
11 480 219	555 785 816	......	......	......	......	......	......	704 554 941
15 517 262	**685 095 465**	......	......	......	......	......	......	**848 300 521**
186 089 504	5 242 137 301	......	......	......	......	......	......	8 973 959 070
......	......	......	......	......	......	......	......	8 652 037
......	......	......	......	......	......	......	......	**8 653 324**
......	......	......	......	......	......	......	......	142 138 824
......	......	......	......	......	......	......	......	5 486 482
......	......	......	......	......	......	......	......	**4 284 696**
......	......	......	......	......	......	......	......	284 330 855
......	......	......	......	......	......	......	......	352 546 122
......	......	......	......	......	......	......	......	**364 862 079**
13 687	59 765	......	......	......	......	......	......	3 266 743 850
......	......	2 210 391	425 712 363	6 899 911	455 187 128	142 785	18 451 788	996 980 646
5 213 742	**322 192 046**	**2 239 699**	**462 550 461**	**7 769 368**	**518 683 014**	**141 659**	**16 516 581**	**1 437 284 399**
5 420 735	324 705 903	65 061 918	3 076 621 692	175 923 067	5 195 000 656	3 723 060	123 341 741	9 865 767 757
......	......	......	......	......	......	......	......	1 017 571
......	......	......	......	......	......	......	......	**931 012**
......	......	......	......	......	......	......	......	160 321 845
......	......	......	......	......	......	......	......	174 489 507
8 582	**226 044**	......	......	......	......	......	......	**158 709 395**
67 434 255	301 370 788	......	......	......	......	......	......	2 275 431 582
......	......	......	......	......	......	......	......	2 527 850
......	......	......	......	......	......	......	......	**3 270 787**
......	......	......	......	......	......	......	......	452 381 448
......	......	......	......	......	......	......	......	40 147 059
......	......	......	......	......	......	......	......	**54 041 941**
......	......	......	......	......	......	......	......	585 510 470
......	......	......	......	......	......	......	......	2 166 815
......	......	......	......	......	......	......	......	**6 473 743**
2 657 660	11 080 836	......	......	......	......	......	......	541 113 293
79	3 380	......	......	......	......	......	......	121 717 838
139	**6 115**	......	......	......	......	......	......	**119 056 992**
469 339	3 539 851	......	......	......	......	......	......	2 118 712 570
......	......	......	......	......	......	......	......	39 393 280
......	......	......	......	......	......	......	......	**39 413 275**
1 018	5 008	......	......	......	......	......	......	846 328 940
......	......	......	......	......	......	......	......	17 950 581
......	......	......	......	......	......	......	......	**7 385 183**
......	......	......	......	......	......	......	......	52 668 243
......	......	......	......	......	......	......	......	51 048 450
......	......	......	......	......	......	......	......	**45 722 972**
4 168 851	19 553 725	......	......	......	......	......	......	736 962 231
......	......	......	......	......	......	......	......	72 287 403
......	......	......	......	......	......	......	......	**28 135 993**
33	116	......	......	......	......	......	......	985 199 641
......	......	......	......	......	......	......	......	8 878 782
......	......	......	......	......	......	......	......	**3 457 179**
......	......	......	......	......	......	......	......	335 668 677
......	......	......	......	......	......	......	......	357 204
......	......	......	......	......	......	......	......	**166 576**
......	......	......	......	......	......	......	......	100 549 427
......	......	......	......	......	......	......	......	68 736 765
......	......	......	......	......	......	......	......	**73 129 965**
......	......	......	......	......	......	......	......	999 253 027
......	......	......	......	......	......	......	......	3 506 974
......	......	......	......	......	......	......	......	**2 885 966**
......	......	......	......	......	......	......	......	39 818 524
......	......	......	......	......	......	......	......	11 330 559
......	......	......	......	......	......	......	......	**11 913 610**
......	......	......	......	......	......	......	......	480 395 279
......	......	......	......	......	......	......	......	44 421 788
......	......	......	......	......	......	......	......	**22 060 385**
......	......	......	......	......	......	......	......	774 454 615
11 480 298	555 789 196	2 210 391	425 712 363	6 899 911	455 187 128	142 785	18 451 788	2 859 054 299
20 739 725	**1 007 519 670**	**2 239 699**	**462 550 461**	**7 769 368**	**518 683 014**	**141 659**	**16 516 581**	**3 356 937 335**
266 275 345	5 902 454 393	65 061 918	3 076 621 692	175 923 067	5 195 000 656	3 723 060	123 341 741	35 887 770 883

Table 3-7B—Production of Lode Gold, Silver, Copper, Lead, and Zinc by Mining Divisions, 1983 and 1984, and Total to Date

Division	Period	Lode Gold		Silver		Copper		Lead		Zinc		Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	
		g	$	g	$	kg	$	kg	$	kg	$	$
Alberni	1983	533 456	8 955 988	24 277 134	11 152 715	2 183 752	3 802 050	1 903 175	338 827	12 845 056	13 641 470	37 891 050
	1984	371 580	5 352 353	16 857 276	5 328 415	1 637 547	2 631 750	1 484 759	702 519	11 055 283	14 694 479	28 709 516
	To Date	18 368 774	80 330 755	420 434 876	90 007 924	60 302 113	84 280 878	30 385 886	16 126 269	277 906 765	185 549 160	456 294 986
Atlin	1983	....	....	44 649	20 538	....	....	....	....	....	....	20 538
	1984	....	....	11 651	4 656	....	....	....	....	....	....	4 656
	To Date	10 706 876	12 135 261	106 098 356	3 119 281	11 239 185	8 160 621	10 833 419	3 464 687	41 313 775	10 869 006	37 748 856
Cariboo	1983	205 591	3 404 366	3 760 807	1 867 126	26 917 380	54 122 879	....	....	....	....	59 394 371
	1984	46 741	673 276	4 668 089	1 631 488	30 745 307	56 875 218	....	....	....	....	59 179 982
	To Date	38 291 373	58 592 884	47 267 323	15 325 489	440 085 747	800 920 208	20 718	11 194	2 445	1 241	874 851 016
Clinton	1983	....	....	....	....	....	....	....	....	....	....	....
	1984	....	....	....	....	....	....	....	....	....	....	....
	To Date	727 499	827 328	982 833	14 397	26 103	5 905	88	7	....	....	847 637
Fort Steele	1983	....	....	115 089 302	51 250 592	....	....	102 319 448	44 641 992	55 292 024	42 925 701	138 818 285
	1984	....	....	87 877 679	28 426 499	....	....	86 471 011	38 339 786	73 826 751	87 905 997	154 672 282
	To Date	390 707	749 363	8 608 824 913	493 324 924	7 163 855	12 534 149	7 088 017 578	1 650 444 655	5 348 671 591	1 429 546 944	3 586 600 035
Golden	1983	....	....	....	....	....	....	....	....	....	....	....
	1984	....	....	....	....	....	....	....	....	....	....	....
	To Date	14 199	28 757	145 133 213	5 422 871	534 700	371 849	118 229 049	26 466 805	152 500 635	33 583 756	65 874 038
Greenwood	1983	4 600	69 588	9 264 884	3 903 928	345	506	90 467	29 737	27 874	77 191	4 080 950
	1984	4 692	69 654	11 183 069	3 523 370	17	13	96 096	38 380	103 382	133 921	3 765 338
	To Date	43 591 256	41 105 136	1 460 551 698	71 669 489	273 353 033	153 551 114	12 410 027	3 182 762	12 208 716	3 278 100	272 786 601
Kamloops	1983	533 736	6 911 714	36 216 541	15 834 449	136 096 790	265 608 961	....	....	....	....	288 355 124
	1984	1 043 460	15 688 634	40 743 968	13 464 457	144 026 502	270 821 510	....	....	....	....	299 974 601
	To Date	9 865 002	119 665 653	371 043 857	104 831 389	1 402 751 290	2 431 431 121	401 661	122 799	245 844	53 511	2 656 104 473
Liard	1983	1 235 566	19 389 074	....	....	....	....	....	....	....	....	19 389 074
	1984	1 085 511	16 169 271	477 312	122 880	....	....	....	....	....	....	16 292 151
	To Date	4 732 664	76 867 590	1 026 216	393 886	13 570 392	19 147 861	7 428	2 736	804	286	96 412 359
Lillooet	1983	1 356	19 237	....	....	....	....	....	....	....	....	19 237
	1984	....	....	....	....	....	....	....	....	....	....	....
	To Date	130 211 779	147 711 754	30 734 694	721 718	181	41	28 413	2 587	144	119	148 436 219
Nanaimo	1983	1 562 016	27 063 422	13 402 457	6 613 975	57 427 186	117 213 556	....	....	....	....	150 890 953
	1984	1 680 863	27 288 328	12 095 000	4 387 201	55 645 721	102 658 987	....	....	....	....	134 334 516
	To Date	26 935 872	221 857 636	190 801 867	46 818 960	697 129 879	1 226 935 325	....	....	....	....	1 495 611 921
Nelson	1983	2 410	37 880	2 518	819	....	....	....	....	....	....	38 699
	1984	22 610	316 393	45 109	16 236	....	....	3 898	1 793	3 220	2 898	337 320
	To Date	41 787 073	42 913 715	324 162 644	9 159 559	6 765 621	1 689 384	240 841 820	69 421 530	686 791 788	223 725 054	346 909 242
New Westminster	1983	597 443	9 895 881	62 746	26 045	....	....	....	....	....	....	9 921 926
	1984	168 424	8 860 238	31 031	8 979	....	....	....	....	....	....	8 869 217
	To Date	1 181 543	22 939 645	576 118	48 276	11 333 143	11 553 105	12 893	1 119	5 786	481	34 542 626
Nicola	1983	....	....	....	....	....	....	....	....	....	....	....
	1984	....	....	....	....	....	....	....	....	....	....	....
	To Date	343 376	396 641	8 605 983	140 939	391 826 751	503 810 678	1 017 092	91 649	147 156	11 135	504 451 042

Omineca	1983	1 115 792	19 206 900	154 118 934	68 681 595	6 966 618	14 181 706	35 645	20 420	31 158	34 850	102 125 471
	1984	**918 083**	**14 479 454**	**170 045 196**	**58 741 088**	**10 381 544**	**19 416 818**	**18 009**	**8 338**	**13 367**	**12 268**	**92 657 966**
	To Date	18 266 423	173 789 074	1 151 642 965	302 516 483	395 274 760	670 700 594	13 943 032	4 018 871	19 748 976	6 295 890	1 157 320 912
Osoyoos	1983	114 917	1 963 727	5 623 549	2 634 189	9 465 992	19 331 528					23 929 444
	1984	**77 276**	**1 073 953**	**4 837 074**	**1 460 191**	**7 494 531**	**12 665 799**	**6 854**	**3 387**	**2 145**	**2 377**	**15 205 707**
	To Date	53 969 441	67 751 866	237 443 658	38 711 106	187 148 542	303 637 851	312 756	105 482	204 521	82 366	410 288 671
Revelstoke	1983			2 408 093	1 045 871	7 768 007	14 917 677			159 074	198 702	16 162 250
	1984	**947**	**13 788**	**1 266 659**	**449 053**	**3 728 948**	**6 531 523**	**17 922**	**4 662**	**4 123**	**3 727**	**7 002 753**
	To Date	1 164 790	1 102 096	132 010 398	4 328 581	11 566 665	21 500 237	16 429 408	3 884 763	12 478 818	3 520 411	34 336 088
Similkameen	1983	513 705	8 536 328	4 563 813	2 009 659	20 782 550	40 502 463					51 048 450
	1984	**431 374**	**6 354 360**	**5 309 052**	**1 744 439**	**20 881 223**	**37 624 173**					**45 722 972**
	To Date	15 506 622	103 066 624	175 942 300	15 644 192	533 669 781	589 863 507	178 550	15 137	36 494	5 258	708 594 718
Skeena	1983	1 166 037	19 358 267	10 881 283	5 152 189	15 068 455	31 194 844	3 237	2 287	1 931	1 801	55 709 388
	1984	**914 138**	**14 220 889**	**4 183 557**	**863 367**	**5 400 711**	**8 297 426**	**1 080**	**500**	**642**	**580**	**23 382 762**
	To Date	81 660 576	127 420 140	2 318 053 546	74 108 062	552 760 153	473 336 107	27 259 490	5 472 930	7 861 961	2 575 741	682 912 980
Slocan	1983	401	7 878	10 619 900	5 034 859			1 000 427	553 086	723 207	942 599	6 538 422
	1984	**856**	**12 653**	**5 640 860**	**1 805 614**			**776 576**	**475 267**	**612 354**	**709 282**	**3 002 816**
	To Date	606 062	1 008 352	2 531 020 793	92 428 536	7 085	2 798	522 004 253	114 318 427	439 273 552	113 260 655	321 018 768
Trail Creek	1983	2 603	46 549	31 575	11 187			294	97	24	17	57 850
	1984	**1 755**	**24 776**	**884**	**270**							**25 046**
	To Date	92 891 524	63 746 669	117 219 203	2 543 861	55 592 776	18 245 404	175 923	61 757	198 067	87 767	84 685 458
Vancouver	1983											
	1984	**4 605**	**66 597**	**6 064**	**1 852**	**108**	**129**			**1 287**	**1 168**	**69 746**
	To Date	20 567 386	66 233 011	198 400 913	10 062 928	507 113 639	243 157 224	13 158 882	5 157 827	114 014 382	34 847 054	359 458 044
Vernon	1983			18 659	6 298							6 298
	1984											
	To Date	165 633	189 982	2 319 862	172 858	297	100	87 255	29 866	33 939	11 667	404 473
Victoria	1983											
	1984	**148**	**2 251**	**2 315**	**821**			**4**	**2**			**3 074**
	To Date	1 375 305	1 238 971	29 480 711	655 388	29 775 654	22 581 791	95 302	19 850	1 618 731	283 923	24 779 923
Not Assigned	1983	103 942	1 688 315	11 938 494	5 126 095	187 622	235 563	7 589 291	3 191 990	26 206 470	21 811 883	32 053 846
	1984	**70 593**	**1 064 275**	**– 1 903 834**	**– 616 731**	**128 338**	**241 968**	**– 3 728 725**	**– 1 675 238**	**9 712 091**	**11 758 955**	**10 773 229**
	To Date	898 938	4 180 504	347 850 632	52 235 380	28 191 943	18 841 781	267 933 430	59 578 522	807 851 539	257 495 349	392 331 536
Total	1983	7 693 571	126 555 114	402 325 338	180 372 129	282 864 697	561 111 733	112 941 984	48 778 436	95 286 818	79 634 214	996 451 626
	1984	**6 813 576**	**111 731 223**	**363 378 002**	**121 364 145**	**280 070 497**	**517 765 234**	**85 147 484**	**37 899 396**	**95 334 645**	**115 225 652**	**903 985 650**
	To Date	614 220 693	1 435 849 407	18 957 629 572	1 434 406 477	5 617 183 288	7 616 259 633	8 363 784 353	1 962 002 231	7 923 116 429	2 305 084 874	14 753 602 622

Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1983 and 1984, and Total to Date

Division	Period	Antimony		Bismuth		Cadmium		Chromite		Iron Concentrates		Manganese		Mercury	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		kg	$	kg	$	kg	$	t	$	t	$	t	$	kg	$
Alberni	1983					14 041	20 143								
	1984														
	To Date					649 263	4 022 340			4 293 517	49 634 711				
Atlin	1983														
	1984														
	To Date					144 799	561 790								
Cariboo	1983														
	1984														
	To Date														
Clinton	1983														
	1984														
	To Date							114	900						
Fort Steele	1983									30 511	777 725				
	1984									53 942	1 577 768				
	To Date					1 542 022	10 064 486			1 538 126	20 160 379				
Golden	1983														
	1984														
	To Date	18 172	14 906			259 654	1 186 526								
Greenwood	1983					68	52								
	1984														
	To Date					38 344	182 600	608	31 395						
Kamloops	1983														
	1984														
	To Date					99	641			19 204	95 851			4 984	5 795
Liard	1983														
	1984														
	To Date														
Lillooet	1983														
	1984														
	To Date	6 108	4 321											4 187	41 304
Nanaimo	1983														
	1984														
	To Date									15 872 977	152 633 401				
Nelson	1983														
	1984														
	To Date					4 059 962	19 859 034								
New Westminster	1983														
	1984														
	To Date														
Nicola	1983									23 906	1 024 361				
	1984									48 634	2 321 [illegible]				
	To Date									544 191	15 429 721				

Omineca	1983														
	1984														
	To Date	53 697	21 882			135 245	628 342							6 085 216	49 171 164
Osoyoos	1983														
	1984														
	To Date											15			
Revelstoke	1983														
	1984														
	To Date	4 261	3 455			46 997	176 102								
Similkameen	1983														
	1984														
	To Date														
Skeena	1983									442 406	11 276 379				
	1984									**95 888**	**2 685 323**				
	To Date					64 360	316 764			14 229 079	185 496 328				
Slocan	1983					1 992	1 627								
	1984					**1 128**	**5 449**								
	To Date	14 453	8 133			1 248 721	5 907 392					491	8 160		
Trail Creek	1983														
	1984														
	To Date					52	210			499	1 925				
Vancouver	1983														
	1984														
	To Date					257 261	1 206 076								
Vernon	1983														
	1984														
	To Date					86	532								
Victoria	1983														
	1984														
	To Date					3 175	10 929					1 058	24 508		
Not Assigned	1983	263 724	1 432 021	47 427	215 319	122 070	402 021								
	1984	**354 375**	**2 023 472**	**9 547**	**112 857**	**113 292**	**547 277**								
	To Date	28 198 573	33 581 562	3 450 140	16 823 482	12 866 210	46 478 557								
Totals	1983	263 724	1 432 021	47 427	215 319	138 171	423 843			496 823	13 078 465				
	1984	**354 375**	**2 023 472**	**9 547**	**112 857**	**114 420**	**552 726**			**198 464**	**6 584 179**				
	To Date	28 295 264	33 634 259	3 450 140	16 823 482	21 316 250	90 602 321	722	32 295	36 497 593	423 452 316	1 564	32 668	6 094 387	49 218 263

Table 3-7C—Production of Miscellaneous Metals by Mining Divisions, 1983 and 1984, and Total to Date—Continued

Division	Period	Molybdenum		Nickel		Palladium		Platinum		Tin		Tungsten (WO$_3$)		Other Value	Division Total
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
		kg	$	kg	$	kg	$	g	$	kg	$	kg	$	$	$
Alberni	1983														20 143
	1984														
	To Date														53 657 051
Atlin	1983														
	1984														
	To Date											132	360		562 150
Cariboo	1983	714 141	6 012 401												6 012 401
	1984	910 227	8 102 008												8 102 008
	To Date	20 089 560	191 157 565					1 883	2 952			12 564	21 431		191 181 948
Clinton	1983														
	1984														
	To Date														900
Fort Steele	1983									136 347	1 985 213				2 762 938
	1984									169 356	2 298 569				3 876 337
	To Date									10 057 743	36 387 918			88 184[5]	66 700 967
Golden	1983														
	1984														
	To Date														1 201 432
Greenwood	1983														52
	1984														
	To Date														213 995
Kamloops	1983	4 318 726	42 891 736												42 891 736
	1984	5 214 258	49 913 639												49 913 639
	To Date	31 813 382	383 770 845									104 730	1 114 350		384 987 482
Liard	1983														
	1984														
	To Date							62	79						79
Lillooet	1983														
	1984														
	To Date	666	2 440					93	113			14 675	37 921		86 099
Nanaimo	1983	1 672 777	9 826 668												9 826 668
	1984	1 461 690	10 446 427												10 446 427
	To Date	12 923 482	132 694 158												285 327 559
Nelson	1983														
	1984														
	To Date	6 819	18 378									8 056 095	43 304 576		63 181 988
New Westminster	1983														
	1984														
	To Date			23 337 783	51 698 754									376 241[3]	52 074 995
Nicola	1983														1 024 361
	1984														2 321 [illegible]
	To Date														15 429 721

Omineca	1983	1 223 038	14 494 825												14 494 825
	1984	**1 822 689**	**21 625 538**												**21 625 538**
	To Date	101 555 884	849 765 996					93	154			1 002 839	4 697 710	420[2]	904 285 668
Osoyoos	1983	2 250 143	14 359 193												14 359 193
	1984	**2 755 942**	**23 715 830**												**23 715 830**
	To Date	49 339 784	417 959 209												417 959 209
Revelstoke	1983														
	1984														
	To Date	1 190 713	4 167 573									3 531	5 687		4 352 817
Similkameen	1983														
	1984														
	To Date							40 246	132 113						132 113
Skeena	1983														11 276 379
	1984														**2 685 323**
	To Date	13 576 543	51 074 369									166	331	1 389[3]	236 889 181
Slocan	1983														1 627
	1984														**5 449**
	To Date														5 923 685
Trail Creek	1983														
	1984														
	To Date	1 652 970	6 514 289			23 296	30 462	1 649	3 177						6 550 063
Vancouver	1983														
	1984														
	To Date														1 206 076
Vernon	1983														
	1984														
	To Date														532
Victoria	1983														
	1984														
	To Date														35 437
Not Assigned	1983													527 348	2 576 709
	1984									**39 198**	**531 917**			**601 998**	**3 817 521**
	To Date							16	213	351 863	3 796 017			43 097 219	143 777 050
Totals	1983	10 178 825	87 584 823							136 347	1 985 213			527 348	105 247 032
	1984	**12 164 886**	**113 803 442**							**208 554**	**2 830 486**			**601 998**	**126 509 160**
	To Date	232 149 803	2 037 124 822	23 337 783	51 698 754	23 296	30 462	44 042	138 801	10 409 606	40 183 935	9 194 732	49 182 366	43 563 453	2 835 718 197

[1] Magnesium.　[2] Cobalt.　[3] Selenium.

Table 3-7D—Production of Industrial Minerals by

Division	Period	Asbestos		Barite[1]		Diatomite		Fluxes (Quartz and Limestone)		Granules (Quartz, Limestone and Granite)	
		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		t	$	t	$	t	$	t	$	t	$
Alberni	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Atlin	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Cariboo	1983	...	...	...	...	1 955	158 260	...	...	...	...
	1984	...	...	...	...	4 100	327 500	...	...	...	...
	To Date	...	...	...	...	39 944	1 678 557	...	...	44	168
Clinton	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Fort Steele	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	7	80	...	...	...	...	...	...
Golden	1983	...	...	...	...	...	...	36 550	1 081 264	...	...
	1984	...	...	29 481	2 169 406	...	...	...	...	...	...
	To Date	...	...	427 869	6 658 713	...	...	103 252	2 445 872	...	...
Greenwood	1983	...	...	...	...	...	...	...	...	9 750	130 000
	1984	...	...	...	...	...	...	...	...	8 000	160 000
	To Date	...	...	...	...	...	...	1 624 308	1 540 319	30 218	921 333
Kamloops	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	703	14 230
Liard	1983	81 653	53 395 853	...	...	...	...	...	...	...	...
	1984	92 123	75 295 765	15 430	542 500	...	...	...	...	...	...
	To Date	2 044 263	871 680 228	15 430	542 500	...	...	...	...	...	...
Lillooet	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Nanaimo	1983	...	...	...	...	...	...	16 928	78 088	...	...
	1984	...	...	...	...	...	...	16 587	58 088	...	...
	To Date	...	...	...	...	...	...	1 142 408	2 577 381	31 506	777 149
Nelson	1983	...	...	...	...	...	...	598	6 962	40 804	899 889
	1984	...	...	...	...	...	...	65	671	4 289	338 134
	To Date	...	...	...	...	...	...	7 558	15 807	367 812	14 802 693
New Westminster	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	403	2 659
	To Date	...	...	...	...	...	...	...	...	99 973	1 614 284
Nicola	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Omineca	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	307	22 551
Osoyoos	1983	...	...	...	...	...	...	...	...	1 365	26 974
	1984	...	...	...	...	...	...	...	...	601	19 786
	To Date	...	...	...	...	...	...	728 113	3 699 031	200 076	2 928 937
Similkameen	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Skeena	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	545 232	1 050 722	...	...
Slocan	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Vancouver	1983	...	...	...	...	...	...	...	...	...	...
	1983	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	26 936	418 606
Vernon	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	2 926	49 298	7 210	190 963
Victoria	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	286	3 505	8 713	157 080
Not Assigned	1983	...	...	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...	...	...
	To Date	...	...	...	...	...	...	...	...	...	...
Totals	1983	81 653	53 395 853	...	...	1 955	158 260	54 076	1 166 314	51 919	1 056 863
	1984	92 123	75 295 765	44 911	2 711 906	4 100	327 500	16 683	58 759	13 293	520 579
	To Date	2 044 263	871 680 228	443 306	7 201 293	39 944	1 678 557	4 154 083	11 381 935	773 498	21 847 994

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[1] From 1972–1983, excludes production which is confidential.

Other: *See* notes on individual materials listed alphabetically on pages 63 to 77.

[2] Natro-alunite.

[3] Hydromagnesite.

[4] Volcanic ash.

[5] Magnesium sulphate.

[6] Sodium carbonate.

[7] Phosphate rock.

Mining Divisions, 1983 and 1984, and Total to Date

Gypsum and Gypsite		Jade		Mica		Sulphur		Other, Value	Division Total
Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value		
t	$	kg	$	t	$	t	$	$	$
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	9 398[2]	9 398
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	20 325[3]	20 325
...	...	...	...	...	...	...	...	...	158 260
...	...	...	...	...	...	...	...	...	327 980
...	...	...	...	4 542 160	143 012	...	...	300[4]	1 822 037
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	5 000	5 000
792	6 236	...	...	...	...	...	...	161 191[3,5,6]	167 427
...	...	...	...	...	...	67 498	4 068 104	...	4 068 104
4 502	39 573	...	...	...	...	79 425	2 740 163	...	2 779 736
106 902	338 397	...	...	...	...	1 975 017	51 088 394	16 894[7]	51 443 765
459 815	4 917 144	...	...	...	...	...	...	999 191	6 997 599
407 327	4 036 394	...	...	...	...	...	...	1 762 777	7 968 657
9 719 934	53 381 057	...	...	...	...	...	...	2 763 244[8,9,17]	65 248 886
...	...	...	...	...	...	...	...	...	130 000
...	...	...	...	...	...	...	...	...	160 000
...	...	...	...	...	...	...	...	783 578[10]	3 245 230
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
1 131 179	6 323 178	...	...	192 640	2 075	...	...	203 055[3,6]	6 542 538
...	...	41 837	397 172	...	...	279 025	12 525 187	...	66 318 212
...	...	83 650	840 713	...	...	277 436	17 085 353	...	93 604 331
...	...	1 813 164	7 255 849	...	...	2 382 470	98 480 889	...	977 959 466
...	...	...	...	...	...	...	...	18 060	18 060
...	...	...	...	...	...	...	...	30 317	30 317
...	...	253 391	467 966	...	...	...	...	53 506[9,14]	521 472
...	...	...	...	...	...	...	...	...	78 088
...	...	...	...	...	...	...	...	...	58 088
...	...	...	...	...	...	...	...	...	3 354 530
...	...	...	...	...	...	...	...	...	906 851
...	...	...	...	...	...	...	...	...	338 885
...	...	...	...	...	...	...	...	55 901[8]	14 874 401
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	2 659
...	...	...	...	...	...	...	...	...	1 614 284
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
2 184	10 050	...	...	...	...	...	...	...	10 050
...	...	54 431	180 000	...	...	...	...	823 053	1 003 053
...	...	40 319	200 000	...	...	...	...	1 625 087	1 825 087
...	...	879 485	2 739 882	...	...	...	...	2 459 600[11,12,15,16]	5 222 033
...	...	...	...	...	...	...	...	...	26 974
...	...	...	...	...	...	...	...	...	19 786
...	...	...	...	720 664	25 938	...	...	306 533[5,10,11]	6 960 439
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
227	1 700	...	...	...	...	...	...	16 858[13]	18 558
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	287 689	10 815	37 761	178 678	...	1 240 215
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	623 773	6 550 969	97 389[8]	7 066 964
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	72 801	3 978	...	...	...	244 239
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	30 226[8,9]	190 811
...	...	...	...	...	...	137 210	8 269 663	1 521 570	9 791 233
...	...	...	...	...	...	152 056	7 389 555	...	7 389 555
...	...	...	...	...	...	6 340 487	116 399 166	16 256 407[1,6,14,15,16]	132 615 573
459 815	4 917 144	96 268	577 172	...	...	483 733	24 862 954	3 361 874	89 496 434
411 829	4 075 967	123 969	1 040 713	...	...	508 917	27 215 071	3 423 181	114 649 821
10 961 218	60 060 618	2 946 040	10 463 697	5 815 954	185 818	11 359 508	272 698 096	23 234 405	1 280 392 641

[8] Iron oxide and ochre.
[9] Talc.
[10] Fluorspar.
[11] Arsenious oxide.
[12] Perlite.
[13] Bentonite.
[14] Pumice.
[15] Sodium Antimonate.
[16] Sodium Sulphate.
[17] Magnesite.

Table 3-7E—Production of Structural Materials by Mining Divisions 1983 and 1984, and Total to Date

Division	Period	Cement	Lime and Limestone	Building Stone	Rubble, Riprap, and Crushed Rock	Sand and Gravel	Clay Products	Unclassified Materials	Division Total
		$	$	$	$	$	$	$	$
Alberni	1983	...	...	...	...	662 710	...	...	662 710
	1984	...	...	...	3 585	610 518	...	...	614 103
	To Date	...	...	...	350 244	13 992 717	...	...	14 342 961
Atlin	1983	...	...	...	...	...	...	...	...
	1984	...	...	...	...	9 263	...	...	9 263
	To Date	...	1 108	...	102 453	408 771	...	...	512 332
Cariboo	1983	302 400	847 676	...	7 438 592	12 777 601	...	...	21 366 269
	1984	380 450	365 045	...	9 228 273	3 637 283	...	...	13 611 051
	To Date	682 850	7 766 686	...	44 004 948	78 403 391	332 457	...	131 190 332
Clinton	1983	...	...	...	143 268	1 609 100	...	...	1 752 368
	1984	...	...	...	278	714 017	...	...	714 295
	To Date	...	...	...	3 513 230	15 303 980	...	...	18 817 210
Fort Steele	1983	...	...	...	19 086	3 100 712	...	...	3 119 798
	1984	...	...	...	848 486	1 007 494	...	...	1 855 980
	To Date	...	43 873	71 941	3 904 636	22 547 826	15 918	...	26 584 194
Golden	1983	...	...	...	...	1 654 438	...	...	1 654 438
	1984	...	358 250	...	...	326 417	...	...	684 667
	To Date	...	359 250	50 840	766 978	8 457 602	128 159	...	9 762 829
Greenwood	1983	...	...	...	...	1 275 480	...	...	1 275 480
	1984	...	...	...	4 973	354 385	...	...	359 358
	To Date	...	150 259	161 090	283 447	7 236 680	121 283	...	7 952 759
Kamloops	1983	10 377 304	...	19 672	5 957 638	4 944 648	...	...	21 299 262
	1984	6 581 157	6 900	...	5 688 647	2 697 135	...	...	14 973 839
	To Date	134 671 953	37 385	59 144	40 056 215	43 131 093	72 379	...	218 028 169
Liard	1983	...	...	...	891 126	11 030 955	...	...	11 922 081
	1984	...	...	...	2 513 357	4 606 578	...	...	7 119 935
	To Date	...	...	...	8 166 027	61 514 462	...	...	69 680 489
Lillooet	1983	...	604 011	...	2 280	373 983	...	...	980 274
	1984	...	587 844	...	11 389	391 462	...	...	990 695
	To Date	...	3 949 988	11 755	1 157 042	4 193 751	...	...	9 312 536
Nanaimo	1983	...	8 629 536	...	1 144 190	3 920 072	...	...	13 693 798
	1984	...	9 621 237	...	1 087 348	2 935 743	...	...	13 644 328
	To Date	...	119 304 144	3 450 735	13 700 479	52 067 195	1 178 992	...	189 701 545
Nelson	1983	...	...	...	72	1 582 228	...	...	1 582 300
	1984	...	1 692 656	...	52 235	849 771	...	...	2 594 662
	To Date	...	9 700 304	437 138	680 008	16 487 367	21 974	...	27 326 791
New Westminster	1983	...	139 766	...	543 073	22 206 348	7 335 946	...	30 225 133
	1984	...	153 484	...	4 621 309	33 164 876	7 230 396	...	45 170 065
	To Date	...	4 447 639	20 974	36 107 431	294 526 529	161 578 840	...	496 681 413
Nicola	1983	...	...	...	43 459	1 098 995	...	...	1 142 454
	1984	...	...	...	83 360	4 069 295	...	...	4 152 655
	To Date	...	...	8 000	314 813	9 814 067	...	...	10 136 880
Omineca	1983	...	...	...	...	3 353 457	...	...	3 353 457
	1984	...	...	...	58 348	2 648 060	...	...	2 706 408
	To Date	...	62 242	701	13 976 035	31 262 027	5 274	...	45 306 279
Osoyoos	1983	...	...	...	610	1 077 059	...	...	1 077 669
	1984	...	...	...	7 832	464 120	...	...	471 952
	To Date	...	43 774	33 018	363 791	10 627 628	...	...	11 068 211
Revelstoke	1983	...	...	8 375	839 003	938 936	...	...	1 786 314
	1984	...	...	15 760	180 001	184 413	...	...	380 174
	To Date	...	1 000	127 830	4 195 958	9 382 102	...	...	13 706 890
Similkameen	1983	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...
	To Date	10 500	11 571	24 000	712 341	6 975 092	13 355	...	7 746 859
Skeena	1983	...	...	...	842 421	4 459 215	...	...	5 301 636
	1984	...	...	...	115 790	1 951 718	...	...	2 067 508
	To Date	...	1 661 362	144 000	17 284 835	44 944 752	13 249	...	64 048 198
Slocan	1983	...	1 905 796	...	...	432 937	...	...	2 338 733
	1984	...	...	...	3 437	465 477	...	...	468 914
	To Date	...	3 117 930	115 143	160 760	5 322 994	...	...	8 716 827
Trail Creek	1983	...	...	...	...	299 354	...	...	299 354
	1984	...	...	...	2 405	139 125	...	...	141 530
	To Date	...	32 500	85 520	383 798	8 787 828	...	...	9 289 646
Vancouver	1983	60 401 278	...	...	33 543	8 301 944	...	...	68 736 765
	1984	62 977 541	...	...	394 340	9 687 938	...	...	73 059 819
	To Date	484 018 802	1 266 200	4 012 560	9 113 196	132 012 870	1 088 592	...	631 512 220
Vernon	1983	...	...	...	2 760	3 497 916	...	...	3 500 676
	1984	...	...	...	10 648	2 974 918	...	...	2 985 566
	To Date	...	351 416	141 367	443 086	37 539 817	161 254	...	38 636 940
Victoria	1983	...	...	...	9 414	11 321 145	...	...	11 330 559
	1984	...	...	...	53 556	11 856 980	...	...	11 910 536
	To Date	326 058 081	1 230 211	55	595 533	116 634 412	10 855 136	...	455 373 428
Not Assigned	1983	...	...	...	...	...	...	...	...
	1984	...	...	...	...	...	...	...	...
	To Date	...	315 498	505 018	2 888 690	67 281 680	3 180 828	5 972 171	80 143 885
Totals	1983	71 080 982	12 126 785	28 047	17 910 535	99 919 233	7 335 946	...	208 401 528
	1984	69 939 148	12 785 416	15 760	24 969 608	86 186 975	7 230 396	...	209 097 295
	To Date	945 442 186	153 854 340	9 480 829	203 225 974	1 098 856 633	178 767 690	5 972 171	2 595 579 823

Table 3-8A—Production of Coal, 1836–1984

Year	Quantity[1]	Value	Year	Quantity[1]	Value
	t	$		t	$
1836–59	37 985	149 548	1922	2 473 692	12 880 060
1860	14 475	56 988	1923	2 391 998	12 678 548
1861	13 995	55 096	1924	1 839 619	9 911 935
1862	18 409	72 472	1925	2 305 337	12 168 905
1863	21 687	85 380	1926	2 182 760	11 650 180
1864	29 091	115 528	1927	2 316 408	12 269 135
1865	33 345	131 276	1928	2 431 794	12 633 510
1866	25 518	100 460	1929	2 154 607	11 256 260
1867	31 740	124 956	1930	1 809 364	9 435 650
1868	44 711	176 020	1931	1 601 600	7 684 155
1869	36 376	143 208	1932	1 464 759	6 523 644
1870	30 322	119 372	1933	1 249 347	5 375 171
1871	50 310	164 612	1934	1 297 306	5 725 133
1882	50 310	164 612	1935	1 159 721	5 048 864
1873	50 311	164 612	1936	1 226 780	5 722 502
1874	82 856	244 641	1937	1 312 003	6 139 920
1875	111 912	330 435	1938	1 259 626	5 565 069
1876	141 425	417 576	1939	1 416 184	6 280 956
1877	156 525	462 156	1940	1 507 758	7 088 265
1878	173 587	522 538	1941	1 673 516	7 660 000
1879	245 172	723 903	1942	1 810 731	8 237 172
1880	271 889	802 785	1943	1 682 591	7 742 030
1881	232 020	685 171	1944	1 752 626	8 217 966
1882	286 666	846 417	1945	1 381 654	6 454 360
1883	216 721	639 897	1946	1 305 516	6 732 470
1884	400 391	1 182 210	1947	1 538 895	8 680 440
1885	371 461	1 096 788	1948	1 455 552	9 765 395
1886	331 875	979 908	1949	1 470 782	10 549 924
1887	419 992	1 240 080	1950	1 427 907	10 119 303
1888	497 150	1 467 903	1951	1 427 513	10 169 617
1889	589 133	1 739 490	1952	1 272 150	9 729 739
1890	689 020	2 034 420	1953	1 255 662	9 528 279
1891	1 045 607	3 087 291	1954	1 186 849	9 154 544
1892	839 591	2 479 005	1955	1 209 157	8 986 501
1893	993 988	2 934 882	1956	1 285 664	9 346 518
1894	1 029 204	3 038 859	1957	984 886	7 340 339
1895	954 727	2 824 687	1958	722 490	5 937 860
1896	909 237	2 693 961	1959	625 964	5 472 064
1897	906 610	2 734 522	1960	715 455	5 242 223
1898	1 146 015	3 582 595	1961	833 827	6 802 134
1899	1 302 088	4 126 803	1962	748 731	6 133 986
1900	1 615 688	4 744 530	1963	771 594	6 237 997
1901	1 718 692	5 016 398	1964	826 737	6 327 678
1902	1 667 960	4 832 257	1965	862 513	6 713 590
1903	1 473 933	4 332 297	1966	771 848	6 196 219
1904	1 712 739	4 953 024	1967	824 436	6 045 341
1905	1 855 121	5 511 861	1968	870 180	7 588 989
1906	1 929 540	5 548 044	1969	773 226	6 817 155
1907	2 255 214	7 637 713	1970	2 398 635	19 559 669
1908	2 143 225	7 356 866	1971	4 141 496	45 801 936
1909	2 439 109	8 574 884	1972	5 466 846	66 030 210
1910	3 007 074	11 108 335	1973	6 924 733	87 976 105
1911	2 305 778	8 071 747	1974	7 757 440	154 593 643
1912	2 913 778	10 786 812	1975	8 924 816	317 111 744
1913	2 461 665	9 197 460	1976	7 537 695	298 683 679
1914	2 029 400	7 745 847	1977	8 424 181	328 846 883
1915	1 883 851	7 114 178	1978	9 463 920	381 895 241
1916	2 343 671	8 900 675	1979	10 570 370	439 280 152
1917	2 209 982	8 484 343	1980	10 823 530	461 492 857
1918	2 336 238	12 833 994	1981	11 752 621	554 271 292
1919	2 207 659	11 975 671	1982	10 645 742	566 878 240
1920	2 587 763	13 450 169	1983	11 480 298	555 789 196
1921	2 422 455	12 836 013	1984	20 739 725	1 007 519 670
			Totals	266 275 345	5 902 454 393

[1] Quantity from 1836 to 1909 is gross mine output and includes material lost in picking and washing. For 1910 and subsequent years the quantity is that sold and used.

Table 3-8B—Coal Production and Distribution

Mine	Raw Coal Production			Clean Coal Production	Coal Used
	Surface	Underground	Total		Making Coke and Plant Use
Fort Steele Mining Division	t	t	t	t	t
Byron Creek Collieries Ltd.					
Thermal	1 497 582	....	1 497 582	1 337 787	....
Crows Nest Resources					
Metallurgical	1 607 088	....	1 607 088	1 114 479	....
Thermal	1 101 042	....	1 101 042	1 148 375	....
Fording Coal Ltd.					
Metallurgical	6 057 255	....	6 057 255	3 794 670	....
Thermal	595 161	....	595 161	220 925	....
Westar Mining Ltd. (Balmer)					
Metallurgical	6 450 382	945 604	7 395 986	4 968 583	....
Thermal	81 518	....	81 518	240 170	....
Westar Mining Ltd. (Greenhills)					
Metallurgical	2 214 121	....	2 214 121	1 782 490	....
Thermal	718 879	....	718 879	728 144	....
Total Fort Steele	20 322 948	945 604	21 268 552	15 335 623	....
Liard Mining Division					
Bullmoose Operating Corp.					
Metallurgical	2 437 000	....	2 437 000	1 719 031	....
Thermal	149 000	....	149 000	66 780	....
Quintette Coal Ltd.					
Metallurgical	5 168 852	....	5 168 852	2 856 603	....
Thermal	1 940 897	....	1 940 897	703 331	....
Total Liard	9 695 749	....	9 695 749	5 345 745	....
Nanaimo Mining Division					
Wolf Mountain Management Ltd.[1]					
Thermal	....	18 000	18 000	....	....
Omineca Mining Division					
Bulkley Valley Coal Ltd.					
Thermal	139	....	139	....	7
Totals 1984					
Metallurgical	23 934 618	945 604	24 880 222	16 235 856	....
Per cent of 1984 totals	80	98	80	79	....
Thermal	6 084 218	18 000	6 102 218	4 445 512	7
Per cent of 1984 totals	20	2	20	21	100
Totals 1984	30 018 836	963 604	30 982 440	20 681 368	7

[1] Estimate.

Table 3-8C—Raw and Clean Coal Produced

Year	Raw Coal Produced			Clean Coal Produced		
	Metallurgical	Thermal	Total	Metallurgical	Thermal	Total
	t	t	t	t	t	t
1973	9 806 384	77 287	9 883 671	6 992 044	58 866	7 050 910
1974	9 503 578	658 697	10 162 275	7 133 053	607 337	7 740 390
1975	12 160 856	777 937	12 938 793	8 872 438	766 733	9 579 802
1976	9 405 065	724 935	10 130 000	6 785 282	713 087	7 498 369
1977	10 564 568	993 022	11 557 590	7 793 920	786 729	8 580 649
1978	11 093 352	1 285 863	12 379 215	8 034 021	1 059 027	9 093 048
1979	13 412 935	1 214 796	14 627 731	9 676 908	906 742	10 583 650
1980	12 901 844	1 261 669	14 163 513	9 098 175	1 058 050	10 156 225
1981	14 547 742	941 878	15 489 620	10 897 614	844 912	11 742 526
1982	13 814 671	3 329 186	17 143 857	9 392 743	2 285 967	11 678 710
1983	13 622 766	3 803 893	17 426 659	9 519 149	2 448 017	11 967 166
1984	24 880 222	6 102 218	30 982 440	16 235 856	4 445 512	20 681 368

by Collieries and by Mining Divisions, 1984

Coal Sales							Total Coal Sold and Used		
Canada			United States	Japan	Others	Total Sales	Quantity	Total Value	Average Value
British Columbia	Other Provinces	Total							
t	t	t	t	t	t	t	t	$	$/t
6 552	829 872	836 424	40 964	267 972	229 212	1 374 572	1 374 572	CONFIDENTIAL	CONFIDENTIAL
....	....	....	....	847 511	190 543	1 038 054	1 038 054		
....	....	....	5 549	38 614	1 027 858	1 072 021	1 072 021		
15 348	16 443	31 791	621	2 637 329	1 072 389	3 742 130	3 742 130		
....	....	....	36 324	159 936	64 091	260 351	260 351		
229	739	968	24	3 064 771	2 125 904	5 191 667	5 191 667		
517	1 215	1 732	78 490	....	170 022	250 244	250 244		
....	....	....	....	638 795	1 135 571	1 774 366	1 774 366		
51 616	....	51 616	29 745	....	732 496	813 857	813 857		
74 262	848 269	922 531	191 717	7 654 928	6 748 086	15 517 262	15 517 262	685 095 465	44.15
....	....	....	....	1 779 499	....	1 779 499	1 779 499	116 748 894	65.61
....	....	....	....	60 054	....	60 054	60 054	952 306	15.86
....	....	....	....	2 776 697	....	2 776 697	2 776 697	196 897 787	70.91
....	....	....	....	597 492	....	597 492	597 492	7 593 059	12.71
....	....	....	....	5 213 742	....	5 213 742	5 213 742	322 192 046	61.80
5 427	....	5 427	3 155	....	....	8 582	8 582	226 044	26.54
132	....	132	....	....	....	132	139	6 115	43.99
15 577	17 182	32 759	645	11 744 602	4 524 407	16 302 413	16 302 413	895 175 302	54.91
20	2	4	....	91	67	79	79	89	....
64 244	831 087	895 331	194 227	1 124 068	2 223 679	4 437 305	4 437 312	112 344 368	25.32
80	98	96	100	9	33	21	21	11	....
79 821	848 269	928 090	194 872	12 868 670	6 748 086	20 739 718	20 739 725	1 007 519 670	48.58

and Coal Sold and Used, 1973–1984

Coal Sold and Used								
Metallurgical			Thermal			Totals		
Quantity	Value	Average Price Per t	Quantity	Value	Average Price Per t	Quantity	Value	Average Price Per t All Types of Coal
t	$	$	t	$	$	t	$	$
6 853 120	87 406 677	12.75	71 613	569 428	7.21	6 924 733	87 976 105	12.70
7 261 404	149 025 665	20.52	496 036	5 567 978	11.22	7 757 440	154 593 643	19.93
8 104 102	305 484 901	37.70	820 714	11 626 843	14.17	8 924 816	317 111 744	35.53
6 824 493	283 753 979	41.58	713 202	14 929 700	20.93	7 537 695	298 683 679	39.63
7 615 953	314 316 005	41.27	808 228	14 639 667	18.11	8 424 181	328 846 883	39.04
8 530 370	361 254 854	42.35	933 550	20 640 387	22.11	9 463 920	381 895 241	40.35
9 591 975	412 392 598	42.99	978 395	26 887 554	27.48	10 570 370	439 280 152	41.56
9 654 317	423 128 068	43.83	1 169 213	38 364 789	32.81	10 823 530	461 492 857	42.64
10 811 498	518 427 584	47.95	914 123	35 843 708	38.09	11 752 621	554 271 292	47.16
8 399 674	487 004 686	57.98	2 246 068	79 873 554	35.56	10 645 742	566 878 240	53.25
9 317 051	491 949 790	52.80	2 163 247	63 839 406	29.51	11 480 298	555 789 196	48.41
16 302 413	895 175 302	54.91	4 437 312	112 344 368	25.32	20 739 725	1 007 519 670	48.58

Table 3-8D—Destination of British Columbia Coal[1]—1984

Destination	Bulkley Valley	Bullmoose		Byron Creek	Crows Nest		Fording Coal		Quintette Coal		Westar (Balmer)		Westar (Greenhills)		Wolf Mtn.[2]	Total Sales		Grand Totals
	Thermal	Metallurgical	Thermal	Thermal	Metallurgical	Thermal	Metallurgical	Thermal	Metallurgical	Thermal	Metallurgical	Thermal	Metallurgical	Thermal	Thermal	Metallurgical	Thermal	
	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t	t
Canada—																		
B.C.	132			6 552			15 348				229	517		51 616	5 427	15 577	64 244	79 821
Alberta											739	998				739	998	1 737
Manitoba				63 747			16 443					217				16 443	63 964	80 407
Ontario				766 125													766 125	766 125
Total Canadian	132			836 424			31 791				968	1 732		51 616	5 427	32 759	895 331	928 090
Foreign—																		
Belgium													220 117			220 117		220 117
Brazil							282 818				280 480		26 477			589 775		589 775
Chile							51 612	64 091			52 932					104 544	64 091	168 635
Denmark														330 155			330 155	330 155
Egypt					35 379	54 428										35 379	54 428	89 807
France				111 791							37 069		187 297			224 366	111 791	336 157
Germany				40 934													40 934	40 934
Holland												55 960					55 960	55 960
Hong Kong														192 144			192 144	192 144
Japan		1 779 499	60 054	267 972	847 511	38 614	2 637 329		2 776 697	597 492	3 064 771		638 795			11 744 602	964 132	12 708 734
Korea					155 164	827 932	369 829	159 936			898 970	114 062	531 357	163 662		1 955 320	1 265 592	3 220 912
Mexico											136 209					136 209		136 209
Pakistan											158 524					158 524		158 524
Phillipines														46 535			46 535	46 535
Spain				49 190													49 190	49 190
Sweden											185 714		30 000			215 714		215 714
Taiwan				27 297		145 498	368 130				184 042		21 323			573 495	172 795	746 290
U.K.											164 558					164 558		164 558
U.S.A.				40 964		5 549	621	36 324			24	78 490		29 745	3 155	645	194 227	194 872
Yugoslavia													119 000			119 000		119 000
Not specified											27 406					27 406		27 406
Total Foreign		1 779 499	60 054	538 148	1 038 054	1 072 021	3 710 339	260 351	2 776 697	597 492	5 190 699	248 512	1 774 366	762 241	3 155	16 269 654	3 541 974	19 811 628
Total all sales	132	1 799 499	60 054	1 374 572	1 038 054	1 072 021	3 742 130	260 351	2 776 697	597 492	5 191 677	250 244	1 774 366	813 857	8 582	16 302 413	4 437 305	20 739 718

[1] Excludes coal used at plants.
[2] Estimated.

Table 3-9—Principal Items of Expenditures for Operations of all Classes

Class	Salaries and Wages	Fuel and Electricity	Process Supplies
	$	$	$
Metal Mining	220 874 810	112 871 988	195 700 953
Exploration and Development	168 136 164	....	....
Coal	263 293 620	91 244 057	58 579 374
Petroleum and Natural Gas (Exploration and Development)	11 306 000	....	....
Industrial Minerals	16 393 305	8 015 501	16 393 305
Structural Materials	19 032 935	22 044 621	19 949 481
Totals			
1984	699 036 834	234 176 167	290 623 113
1983	591 361 447	193 420 434	308 510 743
1982	738 103 508	195 477 056	364 539 992
1981	673 125 913	150 053 316	346 669 928
1980	449 970 343	110 011 602	267 065 783
1979	387 135 371	97 166 988	211 066 592
1978	335 136 110	84 785 125	189 133 090
1977	337 382 149	71 149 313	192 025 357
1976	277 736 828	59 220 204	170 075 616
1975	246 953 568	49 104 838	154 476 238
1974	272 945 078	42 381 258	140 002 685
1973	221 877 595	36 750 711	103 840 649
1972	199 351 449	31 115 621	77 092 955
1971	179 175 692	23 166 904	68 314 944
1970	172 958 282	19 116 672	59 846 370
1969	123 450 327	14 554 123	43 089 559
1968	113 459 219	13 818 326	38 760 203
1967	94 523 495	13 590 759	34 368 856
1966	93 409 528	12 283 477	28 120 179
1965	74 938 736	11 504 343	30 590 631
1964	63 624 559	10 205 861	27 629 953
1963	57 939 294	10 546 806	12 923 325
1962	55 522 171	9 505 559	14 024 799
1961	50 887 275	8 907 034	17 787 127
1960	52 694 818	7 834 728	21 496 912
1959	49 961 996	7 677 321	17 371 638
1958	48 933 560	8 080 989	15 053 036
1957	56 409 056	8 937 567	24 257 177
1956	57 266 026	9 762 777	22 036 839
1955	51 890 246	9 144 034	21 131 572
1954	48 702 746	7 128 669	19 654 724
1953	55 543 490	8 668 099	20 979 411
1952	62 256 631	8 557 845	27 024 500
1951	52 607 171	7 283 051	24 724 101
1950	42 738 035	6 775 998	17 500 663
1949	41 023 786	7 206 637	17 884 408
1948	38 813 506	6 139 470	11 532 121
1947	32 160 338	5 319 470	13 068 948
1946	26 190 200	5 427 458	8 367 705
1945	22 620 975	7 239 726	5 756 628
1944	23 131 874	5 788 671	6 138 084
1943	26 051 467	7 432 585	6 572 317
1942	26 913 160	7 066 109	6 863 398
1941	26 050 491	3 776 747	7 260 441
1940	23 391 330	3 474 721	6 962 162
1939	22 357 035	3 266 000	6 714 347
1938	22 765 711	3 396 106	6 544 500
1937	21 349 690	3 066 311	6 845 330
1936	17 887 619	2 724 144	4 434 501
1935	16 753 367	2 619 639	4 552 730

NOTE—This table has changed somewhat through the years, so that the items are not everywhere directly comparable. Prior to 1962, lode mining referred only to gold, silver, copper, lead, and zinc. Prior to 1964, some expenditures for fuel and electricity were included with process supplies. Process supplies (except fuel) were broadened in 1964 to include "process, operating maintenance and repair supplies . . . used in the mine/mill operations; that is explosives, chemicals, drill steel, bits, lubricants, electrical, etc. . . . not charged to Fixed Assets Account . . . provisions and supplies sold in any company-operated cafeteria or commissary." Exploration and development other than in the field of petroleum and natural gas is given, starting in 1966.

Table 3-10—Employment in the Mineral Industry, 1901–1984

Year	Placer	Metals					Coal Mines			Structural Materials		Industrial Materials	Exploration and Development	Petroleum and Natural Gas Exploration and Development	Total
		Mines		Concentrators	Smelters	Total	Under	Above[1]	Total	Quarries and Pits	Plants				
		Under	Above												
1901	....	2 736	1 212	....	....	3 948	3 041	933	3 974	....	....	....	....	....	7 922
1902	....	2 219	1 126	....	....	3 345	3 101	910	4 011	....	....	....	....	....	7 356
1903	....	1 662	1 088	....	....	2 750	3 137	1 127	4 264	....	....	....	....	....	7 014
1904	....	2 143	1 163	....	....	3 306	3 278	1 175	4 453	....	....	....	....	....	7 759
1905	....	2 470	1 240	....	....	3 710	3 127	1 280	4 407	....	....	....	....	....	8 117
1906	....	2 680	1 303	....	....	3 983	3 415	1 390	4 805	....	....	....	....	....	8 788
1907	....	2 704	1 239	....	....	3 943	2 862	907	3 769	....	....	....	....	....	7 712
1908	....	2 567	1 127	....	....	3 694	4 432	1 641	6 073	....	....	....	....	....	9 767
1909	....	2 184	1 070	....	....	3 254	4 713	1 705	6 418	....	....	....	....	....	9 672
1910	....	2 472	1 237	....	....	3 709	5 903	1 855	7 758	....	....	....	....	....	11 467
1911	....	2 435	1 159	....	....	3 594	5 212	1 661	6 873	....	....	....	....	....	10 467
1912	....	2 472	1 364	....	....	3 836	5 275	1 855	7 130	....	....	....	....	....	10 966
1913	....	2 773	1 505	....	....	4 278	4 950	1 721	6 671	....	....	....	....	....	10 949
1914	....	2 741	1 433	....	....	4 174	4 267	1 465	5 732	....	....	....	....	....	9 906
1915	....	2 709	1 435	....	....	4 144	3 708	1 283	4 991	....	....	....	....	....	9 135
1916	....	3 357	2 036	....	....	5 393	3 694	1 366	5 060	....	....	....	....	....	10 453
1917	....	3 290	2 198	....	....	5 488	3 760	1 410	5 170	....	....	....	....	....	10 658
1918	....	2 626	1 764	....	....	4 390	3 658	1 769	5 427	....	....	....	....	....	9 817
1919	....	2 513	1 746	....	....	4 259	4 145	1 821	5 966	....	....	....	....	....	10 225
1920	....	2 074	1 605	....	....	3 679	4 191	2 158	6 349	....	....	....	....	....	10 028
1921	....	1 355	975	....	....	2 330	4 722	2 163	6 885	....	....	....	....	....	9 215
1922	....	1 510	1 239	....	....	2 749	4 712	1 932	6 644	....	....	....	....	....	9 393
1923	....	2 102	1 516	....	....	3 618	4 342	1 807	6 149	....	....	....	....	....	9 767
1924	....	2 353	1 680	....	....	4 033	3 894	1 524	5 418	....	....	....	....	....	9 451
1925	....	2 298	2 840	....	....	5 138	3 828	1 615	5 443	....	....	....	....	....	10 581
1926	299	2 606	1 735	808	2 461	7 610	3 757	1 565	5 322	493	324	124	....	....	14 172
1927	415	2 671	1 916	854	2 842	8 283	3 646	1 579	5 225	647	138	122	....	....	14 830
1928	355	2 707	2 469	911	2 748	8 835	3 814	1 520	5 334	412	368	120	....	....	15 424
1929	341	2 926	2 052	966	2 948	8 892	3 675	1 353	5 028	492	544	268	....	....	15 565
1930	425	2 316	1 260	832	3 197	7 605	3 389	1 256	4 645	843	344	170	....	....	14 032
1931	688	1 463	834	581	3 157	6 035	2 957	1 125	4 082	460	526	380	....	....	12 171
1932	874	1 355	900	542	2 036	4 833	2 628	980	3 608	536	329	344	....	....	10 524
1933	1 134	1 786	1 335	531	2 436	6 088	2 241	853	3 094	376	269	408	....	....	11 369
1934	1 122	2 796	1 729	631	2 890	8 046	2 050	843	2 893	377	187	360	....	....	12 985
1935	1 291	2 740	1 497	907	2 771	7 915	2 145	826	2 971	536	270	754	....	....	13 737
1936	1 124	2 959	1 840	720	2 678	8 197	2 015	799	2 814	931	288	825	....	....	14 179
1937	1 371	3 603	1 818	1 168	3 027	9 616	2 286	867	3 153	724	327	938	....	....	16 129
1938	1 303	3 849	2 266	919	3 158	10 192	2 088	874	2 962	900	295	369	....	....	16 021
1939	1 252	3 905	2 050	996	3 187	10 138	2 167	809	2 976	652	311	561	....	....	15 890
1940	1 004	3 923	2 104	1 048	2 944	10 019	2 175	699	2 874	827	334	647	....	....	15 705
1941	939	3 901	1 823	1 025	3 072	9 821	2 229	494	2 723	766	413	422	....	....	15 084
1942	489	2 920	1 504	960	3 555	8 939	1 892	468	2 360	842	378	262	....	....	13 270
1943	212	2 394	1 699	891	2 835	7 819	2 240	611	2 851	673	326	567	....	....	12 448
1944	255	1 696	1 825	849	2 981	7 351	2 150	689	2 839	690	351	628	....	....	12 314
1945	209	1 933	1 750	822	2 834	7 339	1 927	503	2 430	921	335	586	....	....	11 820
1946	347	1 918	1 817	672	2 813	7 220	1 773	532	2 305	827	555	679	....	....	11 933
1947	360	3 024	2 238	960	3 461	9 683	1 694	731	2 425	977	585	869	....	....	14 899
1948	348	3 143	2 429	1 126	3 884	10 582	1 594	872	2 466	1 591	656	754	....	....	16 397
1949	303	3 034	2 724	1 203	3 763	10 724	1 761	545	2 306	2 120	542	626	....	....	16 621
1950	327	3 399	2 415	1 259	3 759	10 832	1 745	516	2 261	1 916	616	660	....	....	16 612
1951	205	3 785	3 695	1 307	4 044	12 831	1 462	463	1 925	1 783	628	491	....	....	17 863
1952	230	4 171	3 923	1 516	4 120	13 730	1 280	401	1 681	1 530	557	529	....	....	18 257
1953	132	3 145	2 589	1 371	3 901	11 006	1 154	396	1 550	1 909	559	634	....	....	15 790
1954	199	2 644	2 520	1 129	3 119	9 412	1 076	358	1 434	1 861	638	584	....	....	14 128
1955	103	2 564	2 553	1 091	3 304	9 512	1 100	378	1 478	1 646	641	722	....	....	14 102
1956	105	2 637	2 827	1 043	3 339	9 846	968	398	1 366	1 598	770	854	....	....	14 539
1957	67	2 393	2 447	838	3 328	9 006	1 020	360	1 380	1 705	625	474	....	....	13 257
1958	75	1 919	1 809	625	3 081	7 434	826	260	1 086	1 483	677	446	....	....	11 201
1959	99	1 937	1 761	618	3 008	7 324	765	291	1 056	1 357	484	459	....	....	10 779
1960	86	1 782	1 959	648	3 034	7 423	894	288	1 182	1 704	557	589	....	....	11 541
1961	74	1 785	1 582	626	3 118	7 111	705	237	942	1 828	508	571	....	....	11 034
1962	35	1 677	1 976	949	3 356	7 958	548	228	776	1 523	481	517	270	....	11 560
1963	43	1 713	2 012	850	3 239	7 814	501	247	748	909	460	528	450	....	10 952
1964	5	1 839	1 967	822	3 281	7 909	446	267	713	1 293	444	509	772	....	11 645
1965	2	1 752	2 019	965	3 529	8 265	405	244	649	1 079	422	639	786	441	12 283
1966	2	2 006	2 296	1 014	3 654	8 970	347	267	614	1 269	393	582	1 894	478	14 202
1967	....	1 928	2 532	992	3 435	8 887	260	197	457	1 309	372	584	1 264	507	13 380
1968	....	1 823	2 369	1 072	3 283	8 547	195	358	553	1 207	380	582	3 990	400	15 659
1969	7	1 794	2 470	1 099	3 468	8 831	245	455	700	1 097	549	367	4 270	416	16 437
1970	....	2 160	3 167	1 331	3 738	10 396	242	1 033	1 275	740	647	627	4 964	437	19 086
1971	....	2 073	3 058	1 513	3 481	10 125	444	1 013	1 457	846	794	666	4 040	495	18 423
1972	....	1 833	3 463	1 734	3 353	10 383	214	1 771	1 985	1 116	800	527	4 201	458	19 470
1973	....	1 704	4 005	2 394	3 390	11 493	265	1 951	2 216	898	802	667	3 392	454	19 922
1974	....	1 509	4 239	2 352	2 767	10 867	267	2 255	2 522	895	782	646	2 848	509	19 069
1975	....	1 100	3 619	1 983	3 733	10 435	299	2 464	2 763	826	725	705	2 931	518	18 903
1976	....	1 268	3 733	2 048	3 542	10 591	327	2 300	2 627	931	680	670	3 101	495	19 095
1977	....	1 208	3 768	2 224	3 590	10 790	312	2 556	2 868	1 380	626	766	3 537	490	20 457
1978	....	1 009	3 874	2 029	3 838	10 750	377	2 606	2 983	734	460	618	3 232	496	19 273
1979	....	898	3 615	2 084	4 273	10 870	413	2 931	3 344	931	601	726	3 707	489	20 668
1980	....	1 012	4 173	2 463	4 800	12 448	354	3 258	3 612	473	940	728	5 800	362	24 363
1981	....	1 280	5 292	2 986	4 843	14 401	343	3 277	3 620	131	562	678	7 201	298	26 891
1982	....	1 318	4 722	2 366	4 177	12 583	347	4 305	4 652	131	442	554	6 651	437	25 450
1983	....	1 176	3 788	1 846	3 606	10 416	258	3 991	4 298	122	389	554	3 720	448	19 949
1984	....	881	3 336	1 662	3 369	9 248	318	5 463	5 781	117	375	437	4 789	327	21 834

[1] Commencing with 1967, does not include employment in by-product plants.

Note—These figures refer only to company employees and do not include the many employees of contracting firms.

Table 3-11—Employment at Major Metal and Coal Mines, 1984

Name of Operator and Mine	Tonnes		Days Operating Mill	Average Number Employed[1]					
	Mined	Milled		Administrative	Mine		Mill	Others	Total
					Surface	Underground			
Metal Mines									
Afton Mines Ltd. (Afton)	3 771 366	2 639 082	365	26	209	......	59	......	294
Brenda Mines Ltd. (Brenda)	6 341 000	6 109 067	197	106	94	......	85	......	285
Canada Wide Mines Ltd. (Granduc)	352 630	352 630	91	15	......	53	51	......	119
Carolin Mines Ltd. (Carolin)[2]	292 560	292 560	365	16	......	55	34	15	120
Cominco Ltd. (Sullivan)	1 662 294	2 472 236	338	209	108	407	197	......	921
Cominco Ltd. (Valley Copper)	8 450 952	8 437 148	366	95	181	......	141	12	429
Craigmont Mines Ltd. (Craigmont)	....	....	....	7	......	......	......	......	7
Dankoe Mines Ltd. (Horn Silver)	....	2 637	168	3	......	......	1	......	4
Dickenson Mines Ltd. (Silvana)	7 659	7 381	78	2	3	11	5	......	21
Equity Silver Mines Ltd. (Equity Silver)	2 164 683	2 089 710	365	44	86	......	175	......	305
Erickson Gold Mining Corp. (Erickson)[2]	83 153	83 153	365	10	7	52	13	45	127
Gibraltar Mines Ltd. (Gibraltar)	13 142 000	13 142 000	362	92	......	60	201	......	353
Highmont Mining Corp. (Highmont)	8 565 800	8 565 800	263	55	193	......	79	......	327
Lornex Mining Corp. Ltd. (Lornex)	28 036 467	28 162 932	366	102	492	......	224	100	918
[illegible] Forest Products Inc. (Goldstream)	134 255	134 255	90	9	7	11	11	......	38
Mosquito Creek Gold Mining Co. (Mosquito Creek)[3]	2 329	2 329	42	1	......	......	1	......	2
Newmont Mines Ltd. (Similkameen)	6 615 463	6 516 307	365	75	119	......	110	......	304
Placer Development Ltd. (Endako)	....	....	....	28	......	......	25	......	53
Scottie Gold Mines Ltd. (Scottie)[2]	42 456	43 685	274	6	10	16	17	......	49
Taurus Resources Ltd. (Taurus)	48 923	48 923	345	3	......	15	16	......	34
Teck Corp. Ltd. (Highland Bell)	36 795	36 795	366	7	6	18	10	......	41
Utah Mines Ltd. (Island Copper)	16 324 287	16 360 917	364	133	492	......	183	......	808
Westmin Resources Ltd. (Lynx and Myra)	203 636	203 636	248	69	39	153	24	4	289
Total Metal Mines	....	....	....	1 113	2 046	851	1 662	176	5 848
Coal Mines	Raw Coal								
Bullmoose Operating Corp.	2 586 000	....	366	92	268	......	44	......	404
Byron Creek Collieries Ltd.	1 497 582	....	366	72	143	......	26	......	241
Crows Nest Resources Ltd.	2 708 050	....	366	152	238	......	225	......	615
Fording Coal Ltd.	6 652 416	....	366	105	450	......	131	542	1 228
Quintette Coal Ltd.	7 109 749	....	366	200	1 034	......	224	......	1 458
Westar Mining Ltd. (Balmer)	6 531 900	....	366	418	610	210	135	......	1 373
Westar Mining Ltd. (Greenhills)	2 933 000	....	366	138	248	......	66	......	452
Wolf Mountain	18 000	....	184	2	......	8	......	......	10
Total Coal Mines	....	....	....	1 179	2 991	218	851	542	5 781

[1] The average number of employed includes wage-earners and salaried employees. The average is obtained by adding the monthly figures and dividing by 12, irrespective of the number of months worked.

[2] Estimated.

[3] Mill operated for approximately 3 weeks.

Table 3-12—Metal Production, 1984

Property or Mine (and Location of Mine)	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
				Gold	Silver	Copper	Lead	Zinc	Cadmium
Alberni Mining Division									
Lynx and H-W (Buttle Lake)	Westmin Resources Ltd.	t 203 636	Copper concentrates, 4 335 t; lead concentrates, 3 615 t; zinc concentrates, 23 422 t	g 405 154	g 19 011 347	kg 1 945 768	kg 1 978 933	kg 14 056 197	kg ...
Atlin Mining Division									
Nil	...	...	...	...	...	...	...	...	...
Cariboo Mining Division									
Gibraltar (McLeese Lake)	Gibraltar Mines Ltd.	13 142 200	Copper concentrates, 116 086 t; molybdic oxide, 1 666 t, containing 910 227 kg of molybdenum	...	5 165 354	32 026 361	...	...	...
Mosquito Creek (Wells)	Mosquito Creek Gold Mining Co. Ltd.	2 329	Gold bullion	46 741	13 281	...	...	...	...
Clinton Mining Division									
Nil	...	...	...	...	...	...	...	...	...
Fort Steele Mining Division									
Sullivan (Kimberley)	Cominco Ltd.	2 472 236	Lead concentrates, 140 556 t; zinc concentrates, 163 732 t; tin concentrates, 484 t containing 169 356 kg of tin	...	102 983 487	...	95 172 139	91 670 301	...
Golden Mining Division									
Nil	...	...	...	...	...	...	...	...	...
Greenwood Mining Division									
Highland Bell (Beaverdell)	Teck Corporation	36 795	Lead concentrates, 329 t; zinc concentrates, 201 t; jig concentrates, 345 t	4 043	12 019 441	421	109 440	138 317	...
Jewel (Greenwood)	Dentonia Resources Ltd.	195	Crude ore	1 698	11 726	...	...	...	...
Kamloops Mining Division									
Afton (Kamloops)	Afton Mines Ltd.	2 639 082	Copper concentrates, 32 643 t	972 015	7 855 930	15 802 578	...	...	...
Highmont (Highland Valley)	Highmont Mining Corp.	8 565 800	Copper concentrates, 46 402 t; molybdenite concentrates, 4 003 t containing 2 131 692 kg of molybdenum	...	...	16 321 000	...	...	...
Lornex (Highland Valley)	Lornex Mining Corp. Ltd.	28 162 932	Copper concentrates, 273 051 t; molybdenite concentrates, 2 847 t; molybdic oxide, 2 928 t, containing 3 082 566 kg of molybdenum	...	22 580 533	77 744 825	...	...	...
Valley (Highland Valley)	Cominco Ltd. (Valley Copper Mine)	8 437 148	Copper concentrates, 92 173 t	121 086	14 484 515	39 506 773	...	...	...
Liard Mining Division									
Erickson (McDame Lake)	Erickson Gold Mines Ltd.	83 153	Gold concentrates, 906 t	813 854	500 634	...	...	...	...
Taurus (Cassiar)	Taurus Resources Ltd.	93 398	Gold concentrates, 1 804 t	284 805	...	...	...	...	...
Lillooet Mining Division									
Nil	...	...	...	...	...	...	...	...	...
Nanaimo Mining Division									
Island Copper (Rupert Inlet)	Utah Mines Ltd.	16 360 917	Copper concentrates, 230 323 t; molybdenite concentrates, 3 046 t containing 1 461 690 kg of molybdenum; rhenium shipments are confidential	1 734 765	13 433 965	57 929 749	...	...	...

Nelson Mining Division									
Bayonne (Salmo)	Goldrich Resources Ltd.	1 000[1]	Lead concentrates, 121 t	18 579	57 163	......	6 453	5 345	68
Motherlode (Salmo)	Nugget Mines Ltd.	724	Crude ore	5 763	9 424	152	1 536	723	......
Referendum (Fortynine Creek)	Tom Cherry, Nelson	61	Crude ore	391	1 038	......	153	192	......
New Westminster Mining Division									
Carolin (Hope)	Carolin Mines Ltd.	292 560	Gold bullion; slag, 571 t	576 471	34 479	......	......	......	......
Nicola Mining Division									
Craigmont (Merritt)	Craigmont Mines Ltd.	[2]	Iron concentrates, 48 634 t	......	......	......	......	......	......
Omineca Mining Division									
Endako (Endako)	Placer Development Ltd. (Endako Mines Division)	[2]	Molybdenite concentrates, 197 t; molybdic oxide, 2 564 t; ferro-molybdenum, 252 t; containing 1 822 689 kg of molybdenum	......	......	......	......	......	......
Equity Silver (Houston)	Equity Silver Mines Ltd.	2 089 710	Copper-silver-gold concentrates, 59 016 t	978 983	180 133 000	10 990 901	......	......	......
Silver Standard (Hazelton)	Paul Kindrat, Smithers	280	Crude ore	1 145	681 473	......	30 016	22 279	......
Osoyoos Mining Division									
Brenda (Brenda Lake)	Brenda Mines Ltd.	6 109 067	Copper concentrates, 26 920 t; molybdenite concentrates, 4 904 t containing 2 755 942 kg of molybdenum	79 505	4 488 838	7 790 650	......	......	......
Horn Silver (Keremeos)	Dankoe Mines Ltd.	2 636	Silver concentrates, 181 t; lead concentrates, 39 t	5 846	873 634	......	8 114	6 087	......
Revelstoke Mining Division									
Beatrice (Beaton)	W. Tyner, Kamloops	34	Crude ore	189	93 924	......	5 073	10 894	......
Goldstream (Revelstoke)	Maclaren Forest Products Inc. (Goldstream Mining Division)	134 255	Copper concentrates, 19 543 t; zinc concentrates, 818 t	......	1 175 711	3 645 850	......	318 390	......
Silver Cup (Ferguson)	Allen Matovich, Kaslo	77	Crude ore	830	130 423	......	20 501	8 505	......
Similkameen Mining Division									
Similkameen, Ingerbelle (Princeton)	Newmont Mines Ltd. (Similkameen Division)	6 516 307	Copper concentrates, 72 416 t	526 489	6 435 247	21 677 799	......	......	......
Skeena Mining Division									
Gold Cliff (Stewart)	Nor-Con Exploration Ltd.	11	Crude ore	14	51 587	......	1 800	1 800	......
Granduc (Stewart)	Canada Wide Mines Ltd.	352 630	Copper concentrates, 20 251 t	55 771	3 944 057	5 602 592	......	......	......
Scottie, Summit Lake (Stewart)	Scottie Gold Mines Ltd.	43 685	Gold bullion	863 930	507 049	......	......	......	......
Tasu (Tasu Sound)	Falconbridge Nickel Mines Ltd. (Wesfob Mines Division)	......	Iron concentrates, 95 888 t[3]	......	......	......	......	......	......
Slocan Mining Division									
Chambers (Sandon)	Kaie Resources Ltd.	2 288	Lead concentrates, 110 t; zinc concentrates, 435 t	155	387 627	......	73 417	235 738	1 611
Hall (Sandon)	Hallmac Mines Ltd.	553	Lead concentrate, 67 t	611	328 656	......	23 550	3 196	......
Idaho (Sandon)	L. B. Goldsmith, Silverton	10	Crude ore	......	13 872	......	1 295	1 995	......
J.R.F. (Jackson Creek)	Joseph D. Eimer, Kaslo	3	Crude ore	......	2 555	......	997	......	......
Little Tim (Slocan)	Skagit Mining	1 089	Lead concentrates, 20 t; crude ore, 78 t	......	93 951	94	1 384	472	......
Meteor (Slocan)	H. Sanders, Nelson	9	Crude ore	......	1 393	......	......	......	......
New Springfield (Sandon)	E. H. Peterson, New Denver	15	Crude ore (clean-up)	......	4 075	......	362	4 878	......
Ottawa (Springer Creek)	Roger Thickett, Slocan	1	Crude ore	......	15 959	......	......	......	......

Table 3-12—Metal Production, 1984—Continued

Property or Mine (and Location of Mine)	Owner or Agent	Ore Shipped or Treated	Product Shipped	Gross Metal Content					
				Gold	Silver	Copper	Lead	Zinc	Cadmium
		t		g	g	kg	kg	kg	kg
Republic No. 2 (Slocan)	Don Roy, Slocan	6	Crude ore	37	3 623				
Silmonac, Silvana, Minnehaha (Slocan Lake)	Dickenson Mines Ltd.	7 381	Lead concentrates, 1 046 t; zinc concentrates, 640 t		5 085 107		764 554	405 948	
Victor (Slocan)	E. H. Peterson, New Denver	13	Crude ore	121	72 689		2 906	3 658	
Trail Creek Mining Division									
IXL (Rossland)	IXL Gold Mining and Milling Co. Ltd.	44	Dump clean-up (lead concentrates)	333	49				
Midnight (Rossland)	Cameflan Mines Ltd.	17	Crude ore	1 534	901		52	17	
Vancouver Mining Division									
Ashlu, Hawk No. 1 and No. 2 (Squamish)	Osprey Mining and Exploration Ltd.	36	Gold concentrates, 20 t	3 174	2 957	255	-		
Maggie (Squamish)	Maggie Mines Ltd.	52	Crude ore	1 778	4 275		157	2 835	
Vernon Mining Division									
Nil									
Victoria Mining Division									
[illegible] (Valentine Mountain)	Beau Pre Exploration Ltd.	6	Crude ore	160	2 541		47	19	

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[1] Estimated.

[2] No milling in 1984.

[3] Mine closed in 1983, last shipment in early 1984.

Table 3-13A—Destination of British Columbia Ore and Concentrates, 1984

Destination	Ore	Gold/ Silver/Copper Concentrates	Copper Concentrates	Lead Concentrates	Zinc Concentrates	Iron Concentrates	Molybdenite Concentrates, Molybdic Trioxides, Ferro-Molybdenum	Tin Concentrates
CANADA	t	t	t	t	t	t	t	t
Trail	1 592	1 228	....	145 947	185 204	26 921	....	....
Other Canadian	....	2 975	19 543	....	818	75 655	836	....
FOREIGN								
Australia	....	....	....	....	....	....	21	....
Chile	....	....	....	....	....	....	828	....
China	....	....	38 478	....	....	....	....	....
Germany	....	5	46 402	....	....	....	2 090	....
Holland	....	....	....	....	....	....	112	....
Japan	....	37 929	708 471	....	3 226	95 888	2 404	....
Korea	....	....	67 912	....	....	....	16	....
Mexico	....	6 023	....	....	....	....	....	....
Taiwan	....	....	53 307	....	....	....	....	....
U.K.	....	....	....	....	....	....	....	484
U.S.A.	....	2 023	36	....	....	....	723	....
Europe (not specified)	....	12 089	....	....	....	....	9 774	....
Unknown	....	....	....	....	....	....	5 639	....
Totals	1 592	62 272	934 149	145 947	189 248	198 464	22 443	484

Table 3-13B—Destination of Metals in Ores and Concentrates Shipped from British Columbia Mines—1984
(Showing Metals Paid for and Values)

Country	Gold		Silver		Copper		Lead	
	g	$	g	$	kg	$	kg	$
Canadian Shipments	1 710 802	32 756 617	122 291 976	40 346 981	4 267 176	7 583 012	85 539 883	38 431 288
Foreign Shipments								
Australia	....	....	....	....	....	....	....	....
Chile	....	....	....	....	....	....	....	....
China	....	....	1 716 196	660 131	10 238 465	19 977 190	....	....
Germany	473 893	7 462 191	288 973	74 325	15 484 000	29 087 582	....	....
Holland	....	....	....	....	....	....	....	....
Japan	3 871 430	57 770 684	180 936 615	57 024 323	218 483 369	403 189 607	−127 089	44 588
Korea	....	....	2 202 376	730 401	15 628 164	27 246 353	....	....
Mexico	60 092	1 005 023	15 660 383	5 673 839	949 963	1 828 807	....	....
Taiwan	264 348	5 897 692	2 775 000	1 047 341	12 489 942	23 490 001	....	....
U.K.	....	....	....	....	....	....	....	....
U.S.A.	199 953	2 867 393	−14 916	−29 846	181 144	819 018	....	....
Europe (not specified)	233 058	3 971 623	37 918 124	16 058 341	2 348 274	4 596 496	....	....
Prior year adjustment	....	....	−396 725	−221 691	....	−52 832	−265 310	−576 480
Other (not specified)	....	....	....	....	....	....	....	....
Total Foreign	5 102 774	78 974 606	241 086 026	81 017 164	275 803 321	510 182 222	−392 399	−531 892
Total Shipments	6 813 576	111 731 223	363 378 002	121 364 145	280 070 497	517 765 234	85 147 484	37 899 396

Table 3-13B—Destination of Metals in Ores and Concentrates Shipped from British Columbia Mines—1984
(Showing Metals Paid for and Values)

Country	Zinc		Cadmium		Iron		Molybdenum		Tin	
	kg	$	kg	$	t	$	kg	$	kg	$
Canadian Shipments	93 831 976	113 607 467	114 420	552 726	97 412	3 635 198	516 753	6 970 192	....	....
Foreign Shipments										
Australia	....	....	....	....	....	....	11 218	105 699	....	....
Chile	....	....	....	....	....	....	447 538	2 954 246	....	....
China	....	....	....	....	....	....	....	....	....	....
Germany	....	....	....	....	....	....	955 611	7 009 622	....	....
Holland	....	....	....	....	....	....	51 138	423 777	....	....
Japan	1 502 669	1 618 185	....	....	95 888	2 685 323	1 388 553	14 624 577	....	....
Korea	....	....	....	....	....	....	7 403	58 782	....	....
Mexico	....	....	....	....	....	....	....	....	....	....
Taiwan	....	....	....	....	....	....	....	....	....	....
U.K.	....	....	....	....	....	....	....	....	208 554	2 830 486
U.S.A.	....	....	....	....	5 164	263 658	395 045	3 211 914	....	....
Europe (not specified)	....	....	....	....	....	....	5 355 073	50 038 003	....	....
Prior year adjustment	....	....	....	....	....	....	....	....	....	....
Other (not specified)	....	....	....	....	....	....	3 036 474	28 406 630	....	....
Total Foreign	1 502 669	1 618 185	....	....	101 052	2 948 981	11 648 053	106 833 250	208 554	2 830 486
Total Shipments	95 334 645	115 225 652	114 420	552 726	198 464	6 584 179	12 164 806	113 803 442	208 554	2 830 486

Table 3-14—Petroleum and Natural Gas, 1954–1984

Year	Crude Oil		Field Condensate		Plant Condensate		Natural Gas to Pipeline		Butane		Propane		Total Value
	m³	$	m³	$	m³	$	10³m³	$	m³	$	m³	$	
1954	....	....	....	....	....	....	1 715	6 545	....	....	....	....	6 545
1955	93	480	....	....	....	....	4 752	18 130	....	....	....	....	18 610
1956	23 602	299 322	....	....	....	....	5 292	20 143	....	....	....	....	319 465
1957	54 901	763 751	....	....	4 449	no value	233 138	433 830	....	....	....	....	1 197 581
1958	81 675	1 009 609	....	....	39 915	380 072	1 635 204	3 368 327	12 980	26 115	10 985	22 110	4 806 233
1959	137 484	1 573 227	....	....	81 554	367 797	1 817 945	3 928 839	32 916	66 249	15 410	31 016	5 967 128
1960	137 981	1 531 049	....	....	119 377	459 741	2 257 170	7 101 949	46 643	93 878	19 888	40 029	9 226 646
1961	161 462	1 900 104	25	297	129 349	737 761	2 703 776	8 818 891	51 148	102 946	25 928	52 185	11 612 184
1962	1 415 772	16 827 118	1 530	18 184	133 206	674 644	3 062 513	10 226 323	61 618	124 019	34 500	69 438	27 939 726
1963	1 989 747	24 900 381	2 174	27 205	133 828	536 193	2 973 071	10 719 298	65 041	130 908	32 619	65 651	36 379 636
1964	1 832 404	23 396 716	4 192	63 436	146 622	587 685	3 351 574	12 192 816	73 415	147 763	38 921	78 337	36 466 753
1965	2 141 679	28 696 841	5 053	67 696	150 632	576 106	3 910 948	14 493 255	75 996	152 956	57 042	114 808	44 101 662
1966	2 645 259	36 268 683	6 291	86 265	154 946	312 360	4 543 460	17 339 587	79 650	160 311	53 153	106 981	54 274 187
1967	3 125 181	44 748 477	6 450	92 357	161 541	267 941	5 596 092	21 667 136	93 505	188 197	65 672	132 178	67 096 286
1968	3 521 783	50 082 837	8 611	122 408	152 670	247 455	6 317 544	24 531 445	83 870	168 814	63 723	128 256	75 281 215
1969	4 023 815	58 176 213	12 425	180 520	150 104	263 278	7 218 831	27 897 585	66 385	133 613	52 069	104 800	86 756 009
1970	4 032 130	60 405 941	17 052	277 829	159 489	253 009	7 678 940	29 804 411	49 074	98 772	66 828	134 505	90 974 467
1971	3 999 185	66 471 856	17 331	287 781	177 137	293 287	7 685 055	31 946 372	50 590	101 822	74 547	150 040	99 251 158
1972	3 788 849	63 166 717	16 619	277 069	161 854	327 820	9 939 498	41 616 824	54 200	106 533	76 323	150 015	105 644 978
1973	3 368 902	68 306 032	20 114	407 807	180 088	222 463	10 789 269	54 762 105	109 057	212 640	99 188	193 398	124 104 445
1974	3 012 501	103 335 328	16 561	568 075	178 534	924 549	9 016 996	128 018 726	105 426	232 085	89 373	196 742	233 275 505
1975	2 269 898	94 229 725	16 094	668 092	185 272	6 525 837	9 236 489	214 733 528	106 427	2 577 205	81 975	1 985 087	320 719 474
1976	2 367 450	116 595 050	18 309	901 711	167 576	7 198 957	8 799 508	287 997 059	109 781	4 591 832	88 195	3 688 955	420 973 564
1977	2 200 303	132 859 085	24 465	1 477 248	180 267	9 751 058	8 895 663	396 601 354	111 357	5 358 167	91 297	4 392 944	550 439 856
1978	2 004 699	145 005 524	25 386	1 836 217	155 503	10 269 861	8 003 029	401 373 236	106 580	5 932 766	85 732	4 513 447	568 931 051
1979	2 139 963	168 928 671	32 549	2 569 418	184 398	13 396 500	11 392 641	699 508 127	112 683	7 122 711	84 864	4 851 698	896 377 125
1980	2 002 128	189 561 479	36 855	3 489 431	133 601	11 641 991	8 931 833	612 545 107	89 556	6 491 914	75 507	4 572 704	828 302 626
1981	2 035 953	236 170 548	27 871	3 233 036	124 946	13 284 259	8 062 681	616 795 096	84 635	9 953 076	64 118	5 080 069	884 516 084
1982	2 078 258	333 892 930	20 771	3 337 069	135 185	19 765 399	7 188 561	542 664 470	89 443	9 436 236	68 783	3 806 451	912 882 555
1983	2 078 771	402 075 887	17 636	3 411 155	113 984	20 225 321	6 899 911	455 187 128	80 291	12 897 946	62 494	5 553 842	899 351 279
1984	2 094 156	434 600 112	14 102	2 926 650	131 441	25 023 699	7 769 368	518 683 014	81 972	11 076 111	59 687	5 440 470	997 750 056
Totals	60 765 984	2 905 779 693	368 466	26 326 956	3 927 468	144 515 043	175 923 067	5 195 000 656	2 084 239	77 685 585	1 638 821	45 656 156	8 394 964 089